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The Gulf and Transition

US Policy Ten Years After the Gulf War

Working Draft

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Introduction

This transition study reflects the result of a long-standing project on Gulf net assessment, funded in part by the Smith Richardson Foundation. This project has already produced some eight books, including two major studies of Iranian and Iraqi military forces published in 1999 – Iraq and the War of Sanctions and Iran's Military Forces in Transition (Praeger 1999). Additional detailed briefings and supporting data on the military balance in the Gulf, energy and economic trends. Iranian and Iraqi proliferation, and Gulf arms transfers can be found on the CSIS web page at www.csis.org under the sections market as "Gulf in Transition" and "Strategic Assessment.

This volume is intended to support US policy making and the reader should be aware that the sources used are deliberately chosen to rely as heavily as possible on current official US government documents and reports, unclassified intelligence reporting and estimates, and official international institutions like the World Bank. The goal is to provide data that policy makers are familiar with and can trust. The author, however, is solely responsible for the conclusions and suggestions made in this analysis and no attempt was made to coordinate its content with either any officials or experts in the US government or other policy analysts in the CSIS.

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I. Introduction

The United States enjoys many advantages in the Gulf. In the ten years that have followed the Gulf War, Iran's political regime has become more moderate, and President Khatami's regime has ended much of Iran's support for terrorism and political adventures in the Gulf. Iran has not carried out the conventional military build-up that many feared after its defeat in the Iran-Iraq War. While it has continued to acquire weapons of mass destruction; it has done so at a relatively slow rate.

Iraq is still under the UN sanctions that have prevented any major conventional arms imports since mid-1990. Its forces remain large, but much of their equipment is becoming obsolescent and they lack the combat-trained manpower that won the Iran-Iraq War. While Iraq also is a proliferator, the UN Special Commission (UNSCOM) and International Atomic Energy Agency (IAEA) have deprived it of most of its stocks of chemical and biological weapons and missiles, and of its larger facilities to make chemical, biological and nuclear weapons.

The US maintains close military ties to the Southern Gulf states. It has improved many of its forward command and control and power projection capabilities in the region, and has sharply improved its precision strike capability. It no longer faces any risk of a Russian or external threat in the Gulf region and the Caspian and Central Asia now act as a buffer between the Northern Gulf and Russia. US naval power dominates Gulf waters, the Indian Ocean, and Red Sea. The US has strong coalition partners in Britain and Egypt.

Gulf oil and gas exports flow freely to the US and world markets, and while prices rise and fall, there are have been no recent interruptions in supply. Saudi Arabia, the world's largest oil exporter, has pursued an export strategy that calls for relatively moderate prices, and the Arab-Israeli peace talks have made enough progress to largely eliminate the threat of new oil embargoes and ease US and Arab tensions over US support of Israel.

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Growing Challenges for US Policy

At the same time, the Gulf is scarcely stable and the US faces major and growing challenges that the next Administration must address:

- The US and the world economy are becoming steadily more dependent on imports of Gulf oil and gas. This is not simply a matter of direct imports, but of imports of manufactured goods from Europe and Asia that are dependent on Gulf oil for energy. Oil prices remain erratic, but they are rising. US oil production is declining, and there are no near-term prospects that the US can reduce its growing dependence on energy imports.

- This increased global dependence on Gulf oil exports presents a number of regional problems. Two key Gulf oil producers – Iran and Iraq – face major problems in maintaining and increasing their oil and gas production capacity because of UN and US sanctions. Other key oil producers – such as Saudi Arabia – may lack the capital and incentives to increase production by the amounts needed to meet world demand at moderate prices.

- There are significant political and ideological forces that can divide the US from its Gulf allies, and which affect the challenge posed by Iran and Iraq. The Arab-Israeli conflict remains a source of tension, and the search for a final settlement over issues like Jerusalem, raises issues of fundamental religious concern to states like Saudi Arabia. Islamic extremism remains a problem, challenging both moderate regimes and the US presence in the Gulf.

- Societal change involves a number of destabilizing forces. High levels of population growth and a lack of economic diversification have cut real per capita income by more than 40% since the height of the oil boom in the early 1980s. Hyper-urbanization is breaking down the traditional social structure. A lack of relevant education, welfare and a weak work ethic, and dependence on foreign labor has left the Southern Gulf without new jobs for many of its young men and women. Direct and disguised unemployment are high, often in excess of 25%, in nations undergoing a youth explosion and where more than 60% of the population is under 25 years of age. There are no immediate signs of major political and social unrest in the Southern Gulf, but there are powerful structural problems.

- More than two decades have elapsed since the fall of the Shah of Iran. Much of the fervor of the Iranian revolution has been lost, and Iran has now established good or correct relations with all of its Gulf neighbors except Iraq. Democratic elections have brought a comparatively moderate president and Majlis to power, and Iran has improved its relations with Europe as well as the Southern Gulf. US-Iranian relations, however, remain tense over Iran's proliferation, opposition to US ties to the Southern Gulf states, opposition to the Arab-Israeli peace process, and support of violent anti-Israeli movements like the Hizbollah and Hamas. Iran remains a potential military threat, and its efforts to acquire nuclear weapons and missiles with IRBM and ICBM-like ranges may allow it to pose a future threat to Europe and the United States.

- Nearly a decade has elapsed since the Gulf War, and Iraq remains a hostile power. It is now contained by UN sanctions, and a strong British and US military presence in the Southern Gulf and Turkey. There is no practical prospect for normalized relations with Saddam Hussein and little near-term prospect that he can be removed from power. The UN inspection regime has effectively collapsed and the economic sanctions regime is eroding. In part because economic sanctions have helped cause hardship for the Iraqi people and in part because of the need for Iraqi oil ensure moderate oil prices. Iraq almost certainly continues its

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efforts to develop chemical, biological, and nuclear weapons, and long-range missiles and has stocks of some chemical and biological weapons.

- The improvement in US bilateral military relations with the Southern Gulf states has not been matched by adequate improvements in either the individual national forces of the Southern Gulf countries, or in regional cooperation. While many individual force elements have improved, no Southern Gulf ally has established balanced, combat-capable forces focused on the necessary missions. Military progress within bodies like the Gulf Cooperation Council has been slow, and successes in areas like mine warfare have been offset by delays in developing cooperative air defense systems and a failure to organize the effective defense of the upper Gulf.

- The US advantage in conventional warfighting capability has led nations all over the world to examine forms of asymmetric warfare that might counter the advantages the US has gained from new military tactics, technology, and the "revolution in military affairs." While Iran and Iraq, and various extremist and terrorist movements have so far made only limited progress in this area, the US must increasingly adapt its forces to deal with the threat posed by asymmetric warfare.

- Proliferation is a growing regional threat. Iranian and Iraqi efforts to create chemical, biological, and nuclear weapons, coupled with their development of long-range missile forces have a potentially destabilizing effect on the region. This confronts the US with the need to try to restrain any new capabilities, find ways to encourage arms control, and develop counter-proliferation capabilities to deter the use of weapons of mass destruction and defend its forces and allies against such attacks.

- The US faces internal problems in funding the level of military capability it needs to remain a global superpower. Providing a forward presence in the Gulf and suitable power projection capabilities, are only parts of this larger problem. The fact remains that the US has far smaller forces than it had at the time of the Gulf War, and is still attempting to find the right level of defense spending and military capability to meet its commitments in the Gulf.

- The cutbacks in European power projection capability have been substantially more severe compared to those of the US. Britain, however, still maintains a significant presence in the Gulf. The European Defense Initiative may change this situation, but the US faces the need to redefine coalition warfare in ways that focus on real world power projection capabilities.

Key Issues the Next Administration Must Address

Some of these issues transcend US policy in the Gulf, and others must remain the responsibility of its Southern Gulf allies. The Arab-Israeli peace process is important to Gulf stability, and maintaining the US position in the Gulf, but it must be dealt with as a separate, issue for US policy. The US needs to recognize the demographic, economic, and internal political problems in the Southern Gulf, but the US cannot restructure the society and economies of its allies. The United States can only encourage its allies' own efforts towards internal reform.

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The Need for an Effective US Energy Policy

The remaining security issues, however, have a direct and focused impact on US policy in the Gulf, and will force the US to make major changes in its policies over the next few years. One key area is the need for a more effective energy policy. The US needs to reexamine its growing dependence on Gulf energy and the security implications of that dependence. It needs to understand the broad trends that can affect regional stability, and to determine what, if anything, US policy can do to influence them.

There are four major issues US policy must address in order to develop an effective energy policy:

- *The strategic implications of the shifts taking place in world oil production, and in the shift in Gulf oil exports from a US and European-oriented market to one focused on Asia*. The increases that the US projects in Gulf exports indicate that the volume of Gulf oil exports will more than double by 2020, and that most of the increase in these exports must move by sea to Asia. The end result will be a far more fragile infrastructure for making these exports that will be even more important to the US and global economy.

- *The ability of our Southern Gulf allies to finance the massive increase needed in Gulf oil production capacity, while simultaneously addressing the growing economic problems they are encountering because of a major increases in population, declines in per capita oil wealth, and the failure to diversify their economies.* The free market may be able to provide the capital that the Southern Gulf needs, but the US may have to take a more proactive role in persuading the Southern Gulf states to make the required investments, allow foreign and private investment, reform and diversify their economies, and consider efforts to limit population growth.

- *The future role of Iran in the world oil market and its role in shaping Caspian energy exports*. The US has failed to persuade any other nation of the merits of the sanctions enforced in the Iran-Libya Sanctions Act, and the Act has had no impact on Iran's military expenditures and efforts to proliferate. The Act has succeeded, however, in making foreign investment in Iran's energy development slow and inefficient, and in blocking US investment and involvement in the development of Iranian oil and gas exports. The end result is a US policy that fails to achieve its military security objectives while limiting US ability to achieve its energy and economic objectives.

- *The future role of an Iraq in which Saddam Hussein or some similar figure may remain in power, and where major modifications may be needed to UN sanctions to allow major outside investment in Iraqi energy development.* This will present major problems for US policy because in may mean accepting the failure of UN efforts to force Iraq to cease proliferating, and finding new approaches to containing Iraq.

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Iran and Iraq: The Need to Redefine Dual Containment

The US must change its security policies in the Gulf as well as its energy policies. This means a new approach to Iran and Iraq. "Dual containment" ceased to be an official slogan during the second Clinton Administration, but no clear policy replaced it. The next Administration must treat Iran and Iraq as two very different nations. The US needs to reexamine the political and security trends in each state, and how it should deal with each state in the future.

In the case of Iran, the US has good reasons to question its present sanctions policy, and to consider whether an economic opening to Iran could encourage both Iran's moderates and the development of adequate energy supplies. At the same time, it is far from clear that the US can eliminate the threat posed by Iran's proliferation, hostility to Israel, and support of violent extremist movements. The US will have to find a way to establish correct, if not friendly relations with Iran, but it will have to maintain a high degree of military containment as well.

The US has far fewer incentives to change its policy towards Iraq, but it may well be forced to do so. Economic sanctions have already eroded badly because of the hardships they have imposed on the Iraqi people, and the massive increases in Iraqi oil revenues under the UN oil-for-food program.

However, the present sanctions regime still does not ensure the welfare of Iraq's people, support its economic recovery and development, or ensure the development of its energy resources. Sanctions must be modified to fully relieve the plight of Iraq's people. At the same time, Iraq remains a major conventional military threat. The UN effort to eliminate Iraq's weapons of mass destruction has been effectively paralyzed since the spring of 1998, when UNSCOM was first expelled from the country.

The US has every reason to try to sustain UN efforts to reestablish an inspection regime to try to rid Iraq of its remaining capability to create weapons of mass destruction and long-range missiles, and to enforce sanctions that prevent Iraq from importing weapons and dual-use technology. At the same time such an effort may fail or be limited largely to controls on exports.

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This makes it even more important to maintain a combination of US, Gulf, and European forces that can contain Iraq, and secure Kuwait, the Iraqi-Saudi border, and the Kurdish security area. The US also needs to find more effective ways to encourage a change in regime – which a means major changes in the Iraq Liberation Act.

The Need to Restructure US Military Capabilities in the Gulf

The US has already done much to create an effective military partnership with individual Southern Gulf states. It now needs to do everything it can to encourage them to cooperate more closely with each other, and to develop new approaches to coalition warfare that will give the Southern Gulf states the mission-oriented focus, training, sustainment, and interoperability to fight effectively along side with US forces.

More broadly, the US must continue to restructure its forces to minimize the US presence in the Gulf while maintaining and improving its ability to deploy to the region as quickly as possible. It must seek to develop a true coalition approach to conventional warfare, while recognizing the real-world limitations of its Gulf allies. It must adapt to the new risks posed by asymmetric warfare, and particularly to the range of new threats posed by proliferation. These threats extend far beyond the more traditional threats of missiles and nuclear weapons. The US must also be ready to deal with chemical, biological, and radiological attacks and cyberwarfare, and not only to defend its allies but the American homeland.

The Need to Remember the Gulf's Ties to Other Regions

US policy cannot consider the Gulf alone. If the US cannot achieve a full Arab-Israeli peace settlement, it must make every effort to do so and make a convincing case to the Arab world and Iran that it is making every possible effort to ensure a just settlement. This does not mean tilting on the Arab side, however the perception of being as "honest" a broker as a close ally of Israel can be is important. This means a full Presidential commitment to US engagement towards both Israel and the Palestinian Authority.

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US policy towards the Gulf must take better account of three allies on the edge of the region. The US strategic relationship with Egypt is critical to the Gulf, as well as to cementing an Arab-Israeli peace. Egypt's prestige within the Arab world, military strength, and power projection capabilities make it a key partner in supporting moderate and friendly Gulf regimes. The next Administration must recognize the need to sustain aid to Egypt, but more than that, to continue to treat Egypt as a strategic partner.

Jordan is caught between Iraq and a hard place. It not only faces continuing problems because of the failure to reach a peace between Israel and the Palestinians, it must live with Iraq and the same time it defends its border against it. As is the case with Egypt., the US must seek to expand its strategic partnership and maintain the necessary flow of aid.

Turkey is a critical strategic partner in many ways. In the case of the Gulf, it serves as a buffer between the Gulf and Russia, and has a common border with Iran and Iraq. It is a secular example in a region where Islamic extremism is a continuing threat, it is a key basing area for US forces, and it has a major strategic interest in the future of the Kurds. US energy policy, and policy towards Iran and Iraq, must be reinvented in ways that take full account of Turkish interests.

In contrast, the US is over-engaged in the Caspian and Central Asia. The Clinton Administration involved the US in a new "Great Game" to obtain access to what were perceived as massive oil reserves, limit Russian influence, and prevent Iran from profiting from Caspian oil. In practice, Caspian and Central Asian energy reserves seem to be the size of a new North Sea at most, and will develop slowly. There is no reason to challenge Russia in its own backyard, particularly since Chechnya has shown Russia that it has little reason to reabsorb Islamic and non-Russian minorities.

"Pipeline politics" seem unlikely to hurt Iran's military efforts in any way, but they already interfere with the operations of US companies in the Caspian and Central Asia, create pointless political antagonism in Iran and Russia, and attempt to legislate energy development in Turkey.

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US interests in the Caspian and Central Asia at most require the US to seek a level playing field for US companies in developing the region's energy resources. The best way for the next Administration to win the "new great game" is not to play it.

The US has only residual interests in the Red Sea area. Nevertheless, the Red Sea is a critical route for energy shipments from the Gulf. Saudi Arabia and Yemen are both Red Sea and Arabian states; additionally developments in Djibouti, Eritrea, Ethiopia, Somalia, and the Sudan can affect Gulf and energy security. The US may be best off leaving the area to its allies, and adopting a policy of benign neglect – rather than becoming over-involved in problems it cannot solve. It cannot, however, ignore the region.

India, Pakistan, and the Indian Ocean area are strategically important to the Gulf for three reasons. First, the India-Pakistan nuclear arms race is affecting proliferation in Iran and the Gulf. Second, Pakistan and Afghanistan are emerging as a far more important regional threat in terms of terrorism and Islamic extremism than Iran. Third, India and Pakistan are a major source of foreign labor in the Gulf. In fact there are more Indian and Pakistani workers in Qatar and the UAE than native Arabs. The US must continue to fight proliferation in India and Pakistan and the Pakistani and Afghan role in terrorism and Islamic extremism. At the same time, US naval and power projection forces must be sized so that it is clear that the US can ensure the smooth, secure flow of energy exports to Asia through the Indian Ocean.

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II. The Problem of Energy and Energy Security

US strategic interests in the Gulf center on one key issue: The stable flow of energy exports out of the region at prices that sustain the global economy and encourage global economic growth. The US has important friends and allies in the region. They have supported the US in many foreign policy issues, they are important importers of US goods and investors in the US economy, and they have often been supporters in the Arab-Israeli peace process and the fight against terrorism. They share a common interest in fight aggression and preserving international law. The fact remains, however, it is energy which is America's overriding strategic interest.

Much if not most of the time, the US can rely on market forces to ensure the flow of energy at affordable prices. In fact, the US virtually abandoned serious efforts to shape a national energy and trade policy towards the Gulf during much of the 1990s. It focused on the military security of the Gulf, but paid little attention to energy prices and whether the Gulf would provide energy exports at the volume and price needed to meet world demand.

Since late 1997, however, energy prices have gone through a cycle of "bust and boom" that should force the US to reexamine its policy. An "oil crash" that began in late 1997 and which lasted until early 1999, cut prices to near record modern lows. In the process, it threatened to destabilize the economies of our Gulf allies and led to major cuts in investment in new energy facilities. This situation reversed within a few months in early 1999. A combination of underinvestment and understocking of oil made importers vulnerable to new and more effective production cutbacks by OPEC. The recovery of Asia and harsher winters greatly increased demand. Within roughly a year, oil prices rose from below $10 a barrel to well over $30.

The need to find some way to help the market establish more stable prices, however, is only part of the story. There are military and political threats to oil as well as market uncertainties. The first Arab oil embargo was attempted in 1967, and one dramatically succeeded in 1973-1974. The fall of the Shah of Iran and Iraq's invasion of Iran in 1979-1980 led to a new crisis. Oil supplies and prices remained at risk throughout the eight years of the Iran-Iraq War, and the US

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was forced to fight a low-level "tanker war" against Iran in 1987-1988 to ensure the security of Kuwaiti and other Gulf oil exports. A new war and price crisis occurred when Iraq invaded Kuwait in 1990. Since that time, the US has twice had to deploy large numbers of troops to the Gulf to deter Iraqi pressure on Kuwait, and it was forced to launch a major air campaign against Iraq called "Desert Fox" in December 1998. To all intensive purposes, the US has been forced to deploy military forces to secure the flow of oil through Gulf for more than two decades.

There is no prospect that this situation will change in the near future. There is a near certainty that the world become steadily more dependent on Gulf oil for at least the next two decades. Important as market forces are, the US needs both an energy and a security policy that takes firm account of this fact.

The Gulf and the Importance of Oil Reserves

The Gulf is has long been an important energy exporter. This fact has shaped US policy since the 1930s, and has been a key factor in US security policy ever since the British withdrawal from the Gulf in the 1960s. The Gulf's role as a global energy importer is becoming far more important than it has been in the past, however, and US policy must react to this fact.

Two factors are driving the Gulf's sharply expanding strategic importance:

- *First, oil will retain its importance as a critical energy supply well beyond the period where energy analysts feel it is possible to make meaningful predictions.* While the Energy Information Agency (EIA) of the DOE projects that natural gas will be the fast growing source of energy during 1998-2020, rising at an annual rate of 3.2%, oil consumption will rise by 1.9% a year during this period. Oil will dominate transportation use of energy and will provide 38% of all energy use in quadrillions of British thermal units (Quads) in 2020. This compares with 39% in 1998. The reason that oil's share remains so high as a percent of total world energy consumption is a lower growth in coal, a decline in nuclear energy, and limited increases in renewables and other new sources of energy.[1]

- *Second, the sheer size of the region's oil reserves, particularly those in the Gulf.* In spite of nearly three decades of intensive exploration outside MENA since the oil embargo of 1974, the region now has a larger share of proven world reserves than it did in 1973. Its share of potential world reserves is even higher.[2] The Middle East and North Africa (MENA) as a whole have roughly 715 billion barrels of proven oil reserves, or a little over 68% of all the world oil reserves.[3].It is the Gulf, however, that dominates the Middle East's role in world energy exports. It has about 675 billion barrels of oil and two-thirds of the world's proven oil reserves. [4] It is these oil reserves that give MENA the capability to make major increases in its oil production capacity and exports over the coming two decades.

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Projected Increases in Gulf Oil Production

The importance of Gulf oil reserves is reflected in virtually every estimate of oil production including those of the U.S. Department of Energy (DOE), Organization of Petroleum Exporting Countries (OPEC), and the International Energy Agency (IEA) which has members from every OPEC country.

According to estimates by the Energy Information Agency (EIA) of the U.S. Department of Energy, the entire MENA region exported an average of 18.5 million barrels of oil a day (MMBD) in 1997. This was 35% of the world total of 53.2 MMBD. The DOE projects that total MENA oil exports will rise sharply to 39.1 MMBD by 2020. This will be 75.85% of the estimated world total of 51.6 MMBD.[5] It will also be an increase of more than 110% over the average current level of exports, and a near doubling of the share of total world exports The reference case estimates of the EIA calls for total MENA oil production capacity to increase from 27.1 MMBD in 1998 to 48.1 MMBD. This is a projected rise from 34% of total world capacity in 1998 to 42% in 2020.[6]

The DOE projects that Gulf portion of these oil exports will reach 36.4 MMBD by 2020. This will be 70.5% of the estimated world total of 51.6 MMBD.[7] It will also be an increase of more than 120%. The key to this rise will be a rise in Gulf production capacity from 18.7 million barrels per day (MMBD) in 1990 and 24.0 MMBD in 1998, to 28.0 MMBD in 2005, 31.4 MMBD in 2010, 36.9 MMBD in 2015, and 44.8 MMBD in 2020.[8]

These same estimates project that Gulf oil production capacity of 87% between 1998 and 2020. They also mean that Gulf oil production capacity would rise from 30% of total world capacity in 1998 to 39% in 2020, and that the Gulf would be virtually the only region in the world which will be able to keep its total oil production capacity substantially above its actual level of production.[9] In contrast, the shift in production capacity in the other MENA states in the Levant and North Africa will be very different. There is a projected rise from 2.8 million barrels per day

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(MMBD) in 1990 and 2.9 MMBD in 1998, to 3.6 MMBD in 2005, and 3.9 MMBD in 2010. Production capacity will then drop to 3.7 MMBD in 2015, and 3.5 MMBD in 2020, [10]

As part of this increase, the EIA projects striking increases in the oil production capacity of key Gulf states.

- Saudi Arabia is the lynchpin of world oil production. Its capacity is estimated to increase from 11.4 MMBD in 1998 to 22.1 MMBD in 2020, a 94% increase.
- Kuwait's capacity is estimated to increase from 2.6 MMBD in 1998 to 5.2 MMBD in 2020, a 100% increase.
- The UAE's capacity is estimated to increase from 2.7 MMBD in 1998 to 5.1 MMBD in 2020, an 89% increase.
- Two potentially hostile and sanctioned Gulf states are also projected to make major increases. Iran's capacity is estimated to increase from 3.9 MMBD in 1998 to 5.5 MMBD in 2020, a 40% increase.
- Iraq's capacity is estimated to increase from 2.8 MMBD in 1998 to 6.2 MMBD in 2020, a 120% increase.[11]
- Developments outside the Gulf are far less important. Algeria's capacity is estimated to increase from 1.3 MMBD in 1998 to 2.2 MMBD in 2010, but drop to 2.0 MMBD in 2020. Libya's capacity is estimated to increase from 1.5 MMBD in 1998 to 1.7 MMBD in 2010, but drop back to 1.5 MMBD in 2020.[12]

The Gulf and the Flow of Oil Exports

The projected increases in Gulf oil production capacity are vital to the world economy. They will only rise to meet world demand, however, if there also is a secure and constant flow of exports from the Gulf, and if these exports expand steadily at the rate dictated by world economic growth.

Gulf oil exports are measured in different ways, and estimates differ according to source. According to BP Amoco, they increased from a recent annual average low of 13.4 million barrels a day in 1989 to 18.3 million barrels a day in 1999. These totals included 15.9 million barrels a day worth of crude and 2.4 million barrels worth of product.[13]

Production levels vary over time, however, for a variety of reasons. For example, the EIA estimates that Gulf countries exported 16.3 million barrels per day of oil in 1999. This represented

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a decrease of about 0.8 million barrels per day from 1998. Production cuts announced by OPEC in March 1999 accounted for much of this decline. Iraqi exports, however, rose substantially, from 1.7 million barrels per day in 1998 to 2.1 million barrels per day in 1999. Iraq's exports under the "oil for food" exemption to United Nations sanctions were not covered by the OPEC cutbacks. The OPEC production cuts were reversed in March 2000, with quotas returned to their previous levels, and raised back to their 1998 levels in September 2000. [14] Gulf countries (Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates) produced over 27 percent of the world's oil in 1999. Persian Gulf net oil exports to OECD countries declined to 9.8 million barrels per day in 1999 from 10.5 million barrels per day in 1998, but rose again in 2000 as the global economy recovered and expanded.[15]

The US demand for Gulf oil also varies over time. The EIA reports that U.S. net oil imports from the Gulf peaked in 1977 at 2.45 million barrels per day. They reached a 25-year low of 0.31 million barrels per day in 1985, and then rose to 1.97 million barrels per day in 1990. They rose from 2.13 million barrels per day in 1998 to 2.42 million barrels per day in 1999. More oil was imported to the United States from the Gulf than in any year since 1977. [16]

The vast majority of these imports came from Saudi Arabia (60 percent), with significant amounts from Iraq (29 percent) and Kuwait (10 percent). Only small amounts came from Qatar and the United Arab Emirates. The increase in exports to the United States was largely due to an sharp increase in exports of Iraqi crude to the United States in 1999, and Saudi efforts to expand market share in the United States in an environment of OPEC production cuts. [17]

Direct US imports from the Gulf are a still relatively limited part of total US imports. They totaled less than 1.1 MMBD of crude and product in 1974, when the oil embargo began. They reached a high of 2.MMBD in 1977, then dropped to an average low of only 311,000 barrels per day in 1985. Since that time, they have risen from around 1.6 MMBD in 1997 to 2.1 MMBD in 1998, and 2.4 MMBD in 1999.[18] To put these figures in perspective, total US imports were 6.3

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MMBD in 1973, 6.9 MMBD in 1980, 8.0 MMBD in 1990, 8.8 MMBD in 1995, and 10.6 MMBD in 1999.

Nevertheless, the Gulf provides roughly one-quarter of the steadily increasing level of US oil imports, which have had a recent annual cost approaching of 700 million dollars.[19] Cuts in US domestic production will also increase US dependence on imports over time. Domestic US crude oil production has recently ranged between 5.8 and 6.2 MMBD, down from averages of well over 9 million barrels in 1973, with an additional 1.6-19 million barrels per day of natural gas plant liquids.[20] The EIA projects that Gulf oil exports to North America as rising from 2.3 MMBD in 1997 to 4.4 MMBD in 2020.

What is more important in strategic terms is that estimates of direct imports scarcely reflect the true strategic importance of Gulf oil to the US. Oil is a globally traded commodity and the U.S. must pay the same globally-determined price as any other nation, and the U.S. has a treaty commitment to share all available imports with other OECD importers in a crisis, under the monitoring of the International Energy Agency. As a result it will be affected by the price rise triggered by any interruption in the supply of Gulf oil and have to share the remaining pool of oil with its allies.

Equally important, the U.S. economy is dependent on the overall health of the global economy and is heavily dependent on energy-intensive imports from Asia and other regions. Western Europe's oil imports from the Gulf increased significantly as a percentage of oil demand had in 1997 and 1998, before falling in 1999, when Europe imported 3.3 million barrels per day. This was a decrease of about 0.7 million barrels per day from 1998. The largest share of Persian Gulf oil exports to Western Europe came from Saudi Arabia (40 percent), with significant amounts also coming from Iran (over 28 percent), Iraq (over 24 percent), and Kuwait (7 percent).[21]

Japan imported nearly 4.1 million barrels per day from the Gulf in 1999. Japan's dependence on the Gulf for its oil supplies increased steadily from 1988 to 1997. In 1988, Persian

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Gulf oil imports represented only 57 percent of Japanese oil demand. They reached a peak of 75 percent in 1997-1998 and dipped to 73 percent in 1999 figure. In 1999, almost a third of Gulf exports to Japan came from the United Arab Emirates (31 percent), and nearly one-third coming from Saudi Arabia (30 percent).[22]

Gulf exports to Western Europe are projected to rise from 5.4 MMBD to 5.8 MMBD, while exports to Asia are projected to rise from 9.5 MMBD to 19.9 MMBD. MENA oil exports will maintain Europe's trading economy and be the key to Asia growth.[23] In this case, what comes round literally means that oil must go round.

Furthermore, Gulf oil will be of even more importance to the world economy if problems occur in the exports of other troubled regions. The exports of the FSU are projected to rise from 2.8 MMBD in 1997 to 8.3 MMBD in 2020, North Africa is projected to rise from 2.3 MMBD to 2.7 MMBD, and West Africa from 1.8 MMBD to 2.0 MMBD. [24] The risk of some event in one country in these three regions resulting in a significant interruption in oil production is at least as high as the risk in an interruption in exports from the Gulf.

One of the many problems in US energy policy is that the US does not officially recognize the importance of its indirect imports, although it is clear that Gulf oil is already critical to US's main sources of manufactured goods in Europe and Asia and will come steadily more important with time. All US data on energy imports is measured only in terms of direct imports. Such estimates are obsolete and misleading, but no recent Administration has cared enough to correct this critical omission in the basic data it uses for planning.

The Cost of a Major Gulf Interruption in Exports or Oil Embargo

The US does produce estimates of the more limited impact an interruption in the flow of direct imports could have on the US economy. The US is less sensitive to the price impacts of increases in energy prices than it was in the past. Energy accounted for 14% of the US GDP in 1981 and only 7% in the mid-1990's. The share of petroleum fell to only 3%. As a result, even

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$30 oil adds only about 0.5% in terms of direct increases to the US consumer prince index and lowers GDP growth by around 0.5%.[25]

Put differently, the EIA estimates that oil prices increase by $3-5 per barrel for every disruption of one million barrels per day of oil, and that the growth rate of the U.S. Gross Domestic Product growth rate is reduced by between 0.3-0.5 percentage points by such a disruption. In other words, if U.S. GDP is expected to increase and a 3.0 percent or one million barrel per day oil supply disruption occurred, the U.S. GDP would be expected to grow by only 2.5-2.7 percent (a reduction of 0.3-0.5 percentage points).[26]

These estimates, however, cannot anticipate the political and panic effects of a crisis on oil prices and the global economy, and it is important to note that the historical swings in oil prices have been very, very sharp in response to various crisises. For example, oil prices rose from around $10 a barrel before the 1973-1974 oil embargo to levels of $30-35 a barrel in constant 1998 dollars, and stayed there until 1978. The Iranian revolution and Iran-Iraq War led them up to peaks of $60-65 a barrel in 1980-1981, only to have them skid down to levels averaging $20-24 a barrel from 1986-1997. The sudden economic collapse in East Asia and the resulting "oil crash" led them to levels close to $10, only to rise to over $30 in mid-2000.[27]

Gulf-wide political embargoes do not seem likely today. Iran and the Arab oil-exporting states need to maintain their cash flow, and the Southern Gulf states have shown only limited solidarity with the Palestinians since Arafat supported Iraq in 1990. Even in 1974, the "embargo" led the world market to rapidly increase production in other areas, and the crisis was caused as much by the world's inability to track the available oil supply in real time as by any actual shortfall in supply. This situation has been largely resolved by improved tracking and reporting after a less intensive crisis following the fall of the Shah of Iran. Neither the "tanker war" between Iran and Britain and the U.S. in 1987-1998, or the Gulf War in 1990-1991, led to critical price rises or hoarding.

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It is important to note, however, that regional conflicts do present a risk of major military disruptions. Iran is focusing its limited defense resources on improving its capability to threaten traffic through the Gulf and develop weapons of mass destruction. Iraq is almost certain to reemerge as a mid- to long-term threat to the moderate Gulf states and the West, equipped with long-range strike systems and weapons of mass destruction.

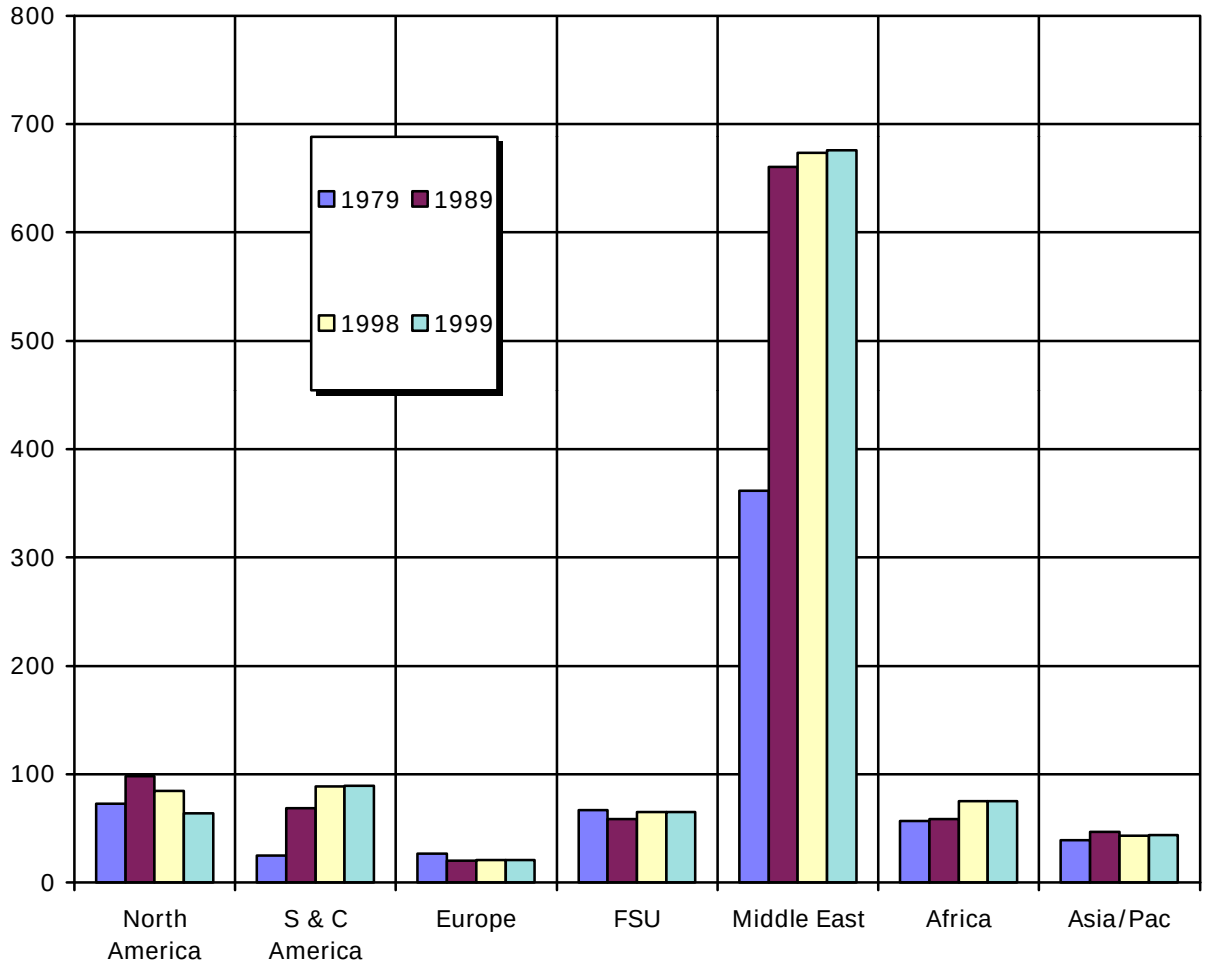
The mid to long-term impact of any such disruptions in the flow of Gulf oil will also become steadily more important in the future. Current EIA projections indicate that global economic dependence on Gulf oil will more than double during the coming decade, and any major interruption would then probably trigger a global economic crisis. By 2005-2010, the Gulf may also be a region with enough weapons of mass destruction to create interruption scenarios that are far more serious than those Iran or Iraq might create today.

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Figure I-1

The Sustained Importance of Gulf Oil Reserves: Shifts in the Regional Balance of Global Oil Reserves

(Billions of Barrels)



1979	73	25.2	26.6	67	361.8	57.1	39.4
1989	98.4	68.7	20.5	58.4	660.3	58.8	46.6
1998	84.7	89	20.8	65.4	673.6	75.4	43.1
1999	63.7	89.5	20.6	65.4	675.7	74.9	44

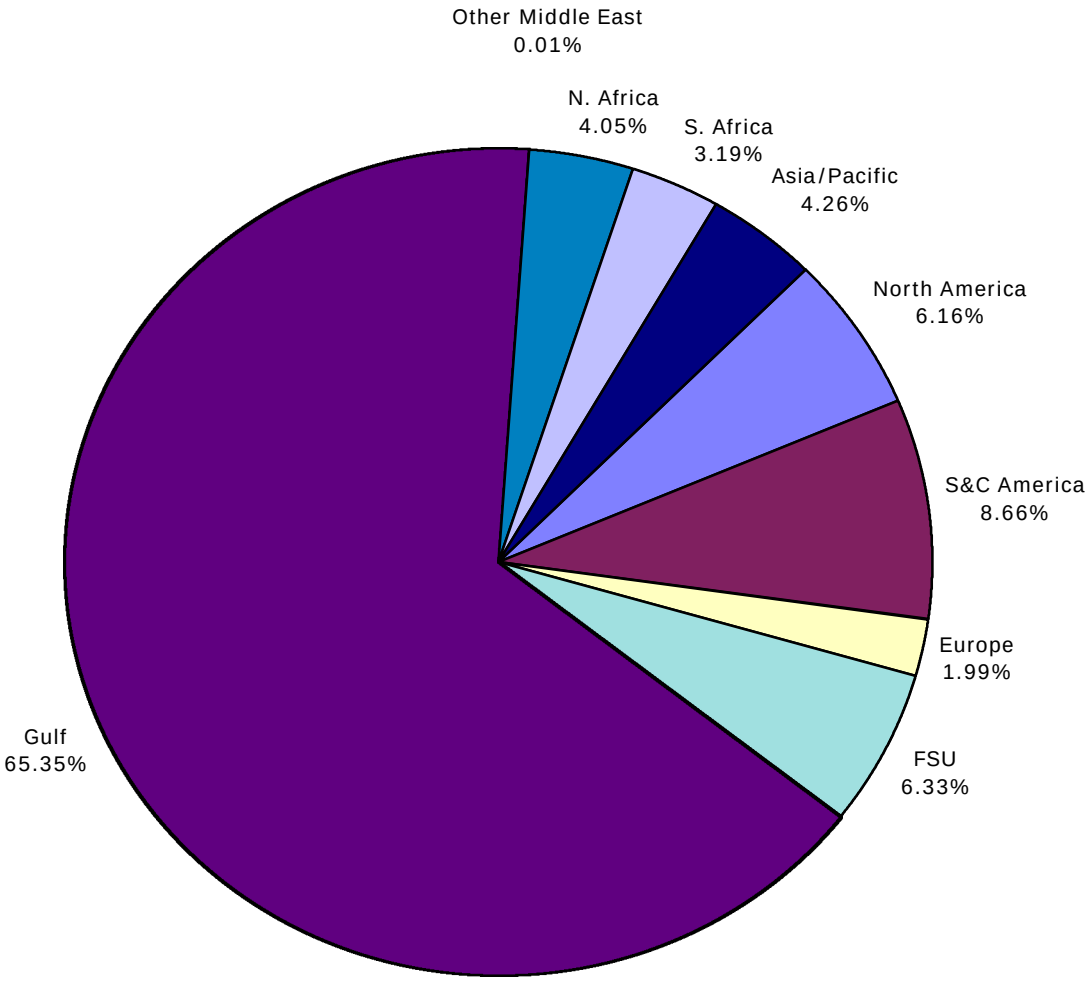
Source: Oil and Gas Journal, and BP Statistical Review of World Energy, 2000, p. 4.

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Figure I-2

The Gulf Dominates Future Oil Supply: World Oil Reserves by Region as a Percent of World Total

(Based on Oil and Gas Journal Forecast for a World Total of 1,052.9 billion barrels)

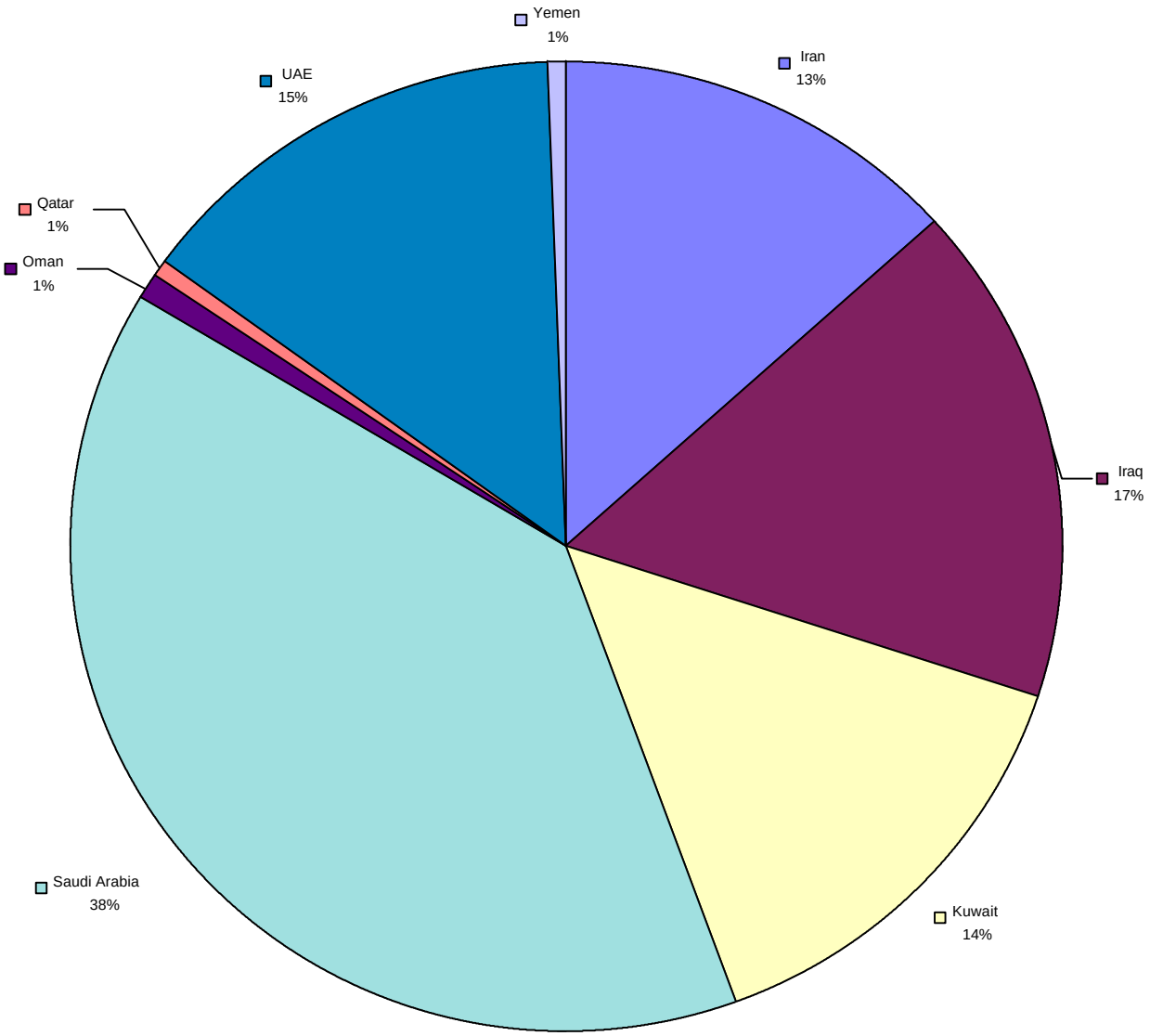


Source: Oil and Gas Journal, and BP Statistical Review of World Energy, 2000, p. 4.

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Figure I-3

Country Shares of Gulf Oil Reserves
(in Percent of Total)



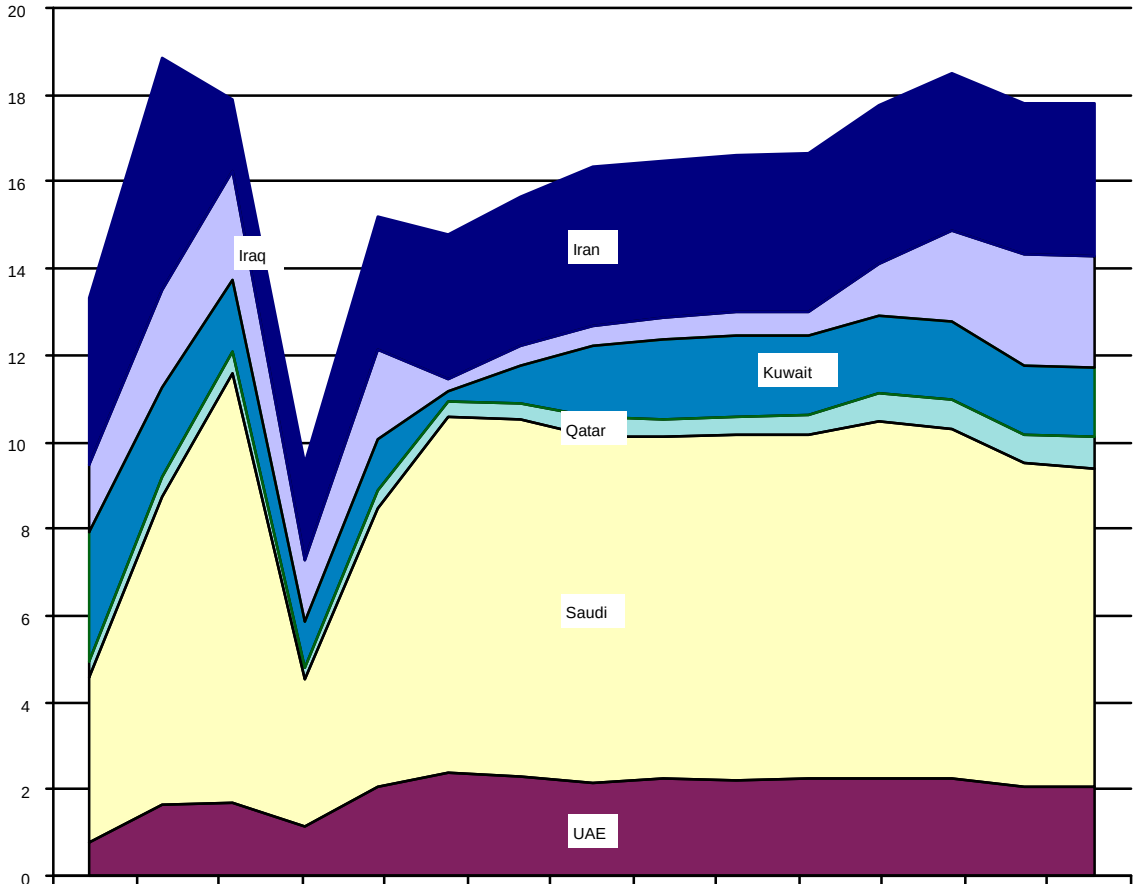
Source: BP Amoco Statistical Review of World Energy, 2000, p.4.

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Figure I-4

CEA Estimate of Historical Trends in Gulf Oil Production: 1970-1997

(In Millions of Barrels per Day)



	1970	1975	1980	1985	1991	1992	1993	1994	1995	1996	1998	1999	Jan-
Iran	3.83	5.35	1.66	2.25	3.33	3.43	3.65	3.61	3.65	3.67	3.6	3.48	3.5
Iraq	1.55	2.26	2.51	1.43	0.3	0.43	0.44	0.51	0.55	0.57	2.11	2.55	2.6
Kuwait	2.99	2.08	1.66	1.02	0.19	0.86	1.69	1.83	1.84	1.81	1.8	1.62	1.6
Qatar	0.36	0.44	0.47	0.3	0.39	0.4	0.42	0.4	0.45	0.49	0.66	0.64	0.7
Saudi	3.8	7.08	9.9	3.39	8.18	8.23	7.96	7.9	7.94	7.91	8.07	7.42	7.35
UAE	0.78	1.66	1.7	1.13	2.39	2.28	2.17	2.22	2.2	2.23	2.25	2.08	2.05

Adapted by Anthony H. Cordesman from Cambridge Energy Associates, World Oil Watch, 2000, Cambridge,, Mass., 2000, p. 26.
*Pre-1992 data: CEA, World Oil Trends, 1998, Cambridge, Mass., 1998, pp. 26-27. After 1992: the IEA, Oil Market Report, May 11, 2000. p. 45.

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Gas Reserves and Exports

The story concerning the Gulf's role in global gas exports is less dramatic, but still important. Total global consumption of natural gas is projected to rise from 83.9 Quads in 1998 to 173.3 Quads in 2020, an increase of 106%.[28] The Gulf has some 49.5 trillion cubic meters of reserves, or roughly 34% of the world total. If other Middle Eastern states like Egypt, Algeria, and Libya are added to this total, they provide another 241.3 trillion cubic meters of gas, or 4.7% of the world's proven gas reserves, raising the total to 38.7%.[29]

At present, the Gulf and the Middle East are relatively small gas exporters. Oman is the only Gulf nation with significant pipeline and ships only utilizes 1.5 billion cubic meters out of the world's pipeline capacity of 360.51 billion cubic meters. Algeria is a much bigger pipeline shipper, but still ships only uses 33.7 billion cubic meters, about 9% of world supply. [30]

The world LNG trade totals around 124 billion cubic meters. Qatar and the UAE are the only major Gulf shippers. Qatar now ships 8.13 billion cubic meters – roughly 7% of the world total – and the UAE ships 7.1 billion cubic meters – roughly 6% of the world total. Algeria and Libya are more significant. Algeria now ships 25.76 billion cubic meters – roughly 21% of the world total – and the Libya ships 0.96 billion cubic meters – less than 1% of the world total. Taken as a whole, the Gulf accounts for 16.73, or 3.5% of the total world gas exports of 484.71 trillion cubic meters. The Middle East accounts for 76.1 trillion cubic meters or 15.7% of world exports.[31]

The future, however, is likely to be a very different story. Gulf gas reserves are so large that nations like Iran, with the world's second largest reserves of 812.3 TCM, are major potential exporters. Qatar as at least 300 TCM and already plans to be a major exporter. The UAE has 212 TCM and Saudi Arabia has 204.5 TCM and both plan to steadily increase their exports in the form of petrochemicals and feedstocks. Oman plans to expand its exports although it has only 26.4 TCM of proven reserves. Algeria has 159.7 TCM, Egypt has 35.2 TCM, and Libya has 46.4 TCM; all plan to increase their gas exports.[32]

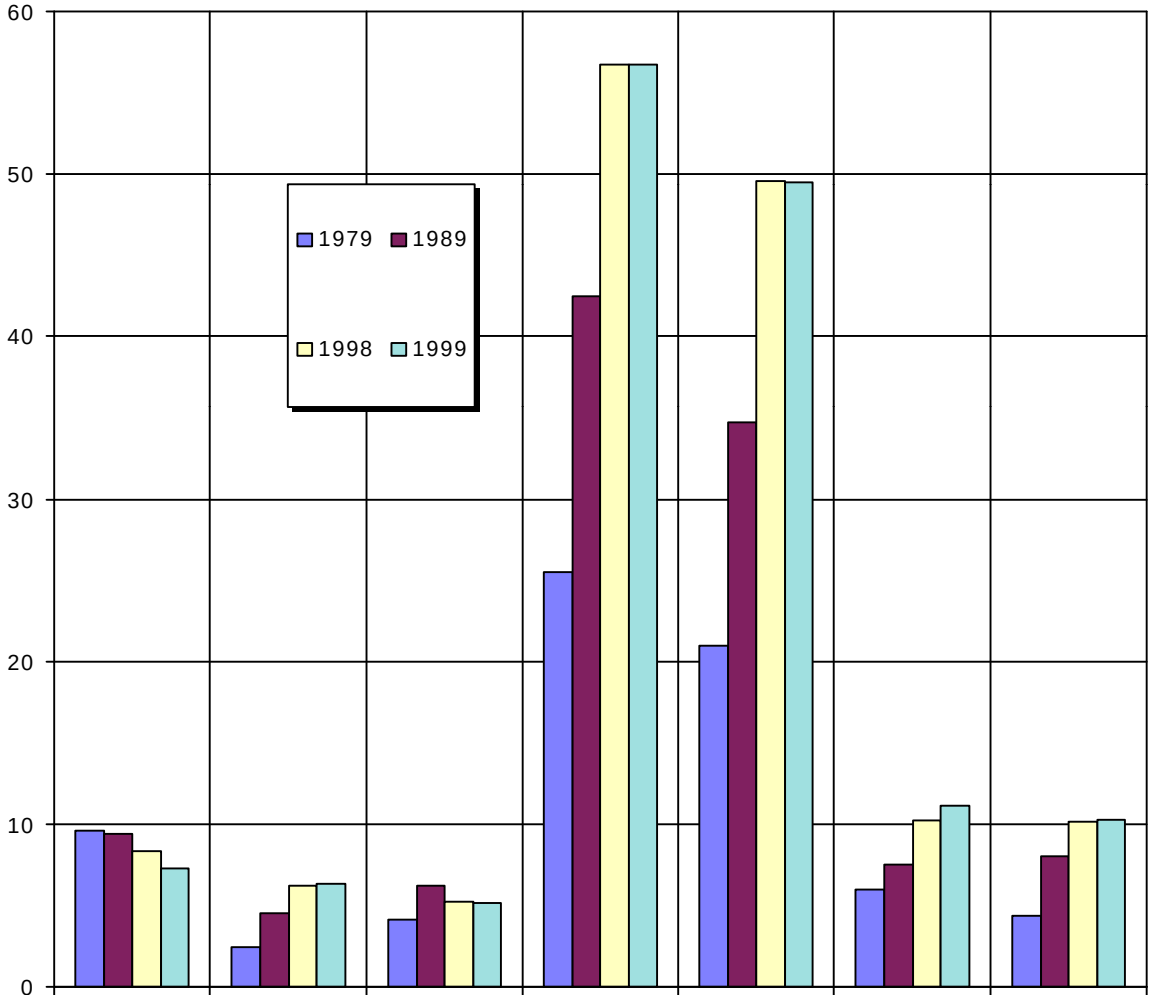
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Figure I-5

The Growing Role of the Middle East and Gulf in the Regional Balance of World Gas Reserves: 1979-1999

(Trillions of Cubic Meters)



	North America	S & C America	Europe	FSU	Middle East	Africa	Asia/Pac
1979	9.58	2.42	4.13	25.48	20.95	5.96	4.35
1989	9.42	4.54	6.18	42.47	34.72	7.55	8.03
1998	8.35	6.21	5.21	56.7	49.53	10.22	10.17
1999	7.31	6.31	5.15	56.7	49.52	11.16	10.28

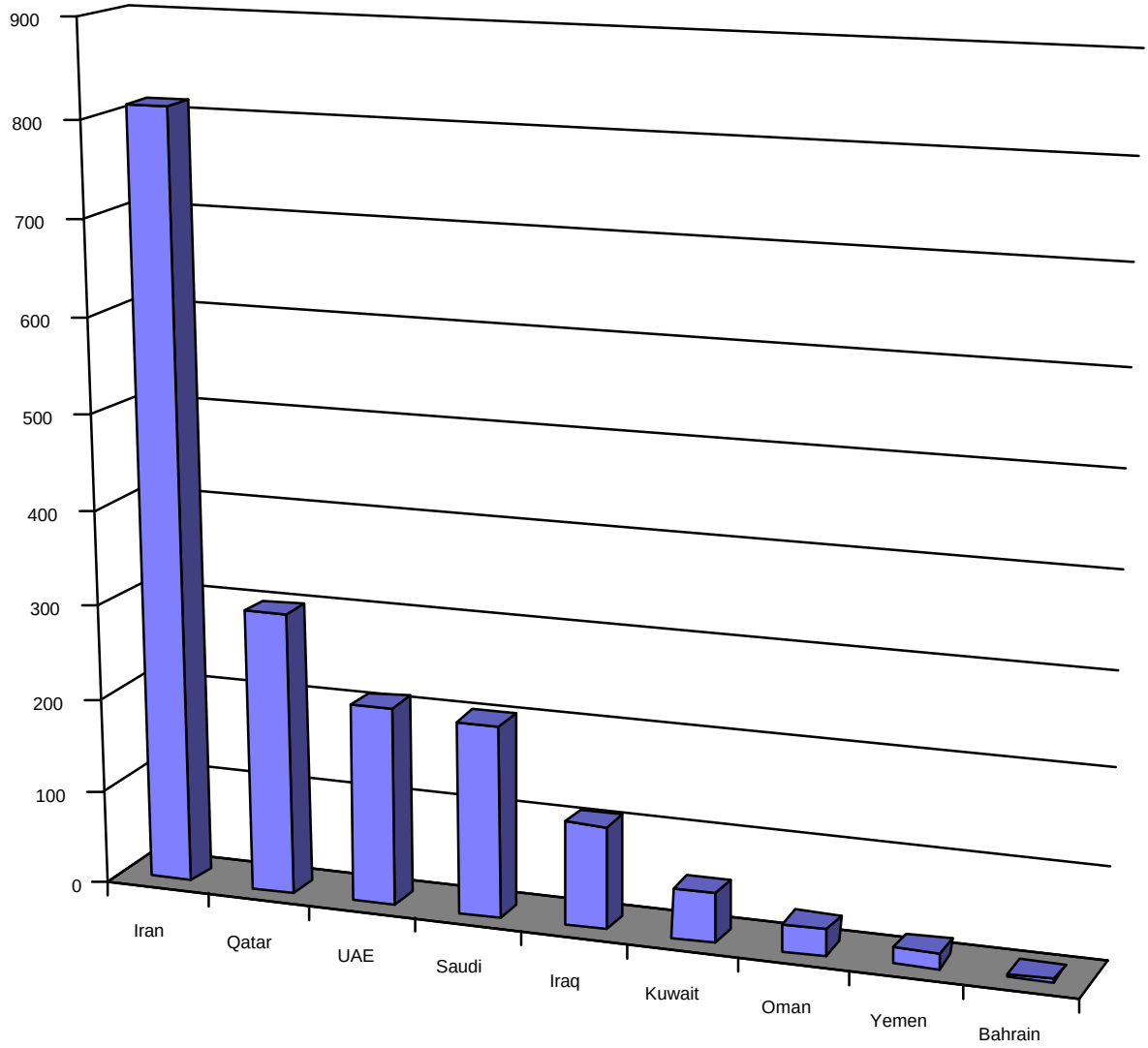
Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 2000, p. 20.

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Figure I-6

The Importance of Gulf States in Terms of Proven World Gas Reserves by Nation

(Trillions of Cubic Feet in Reserves)



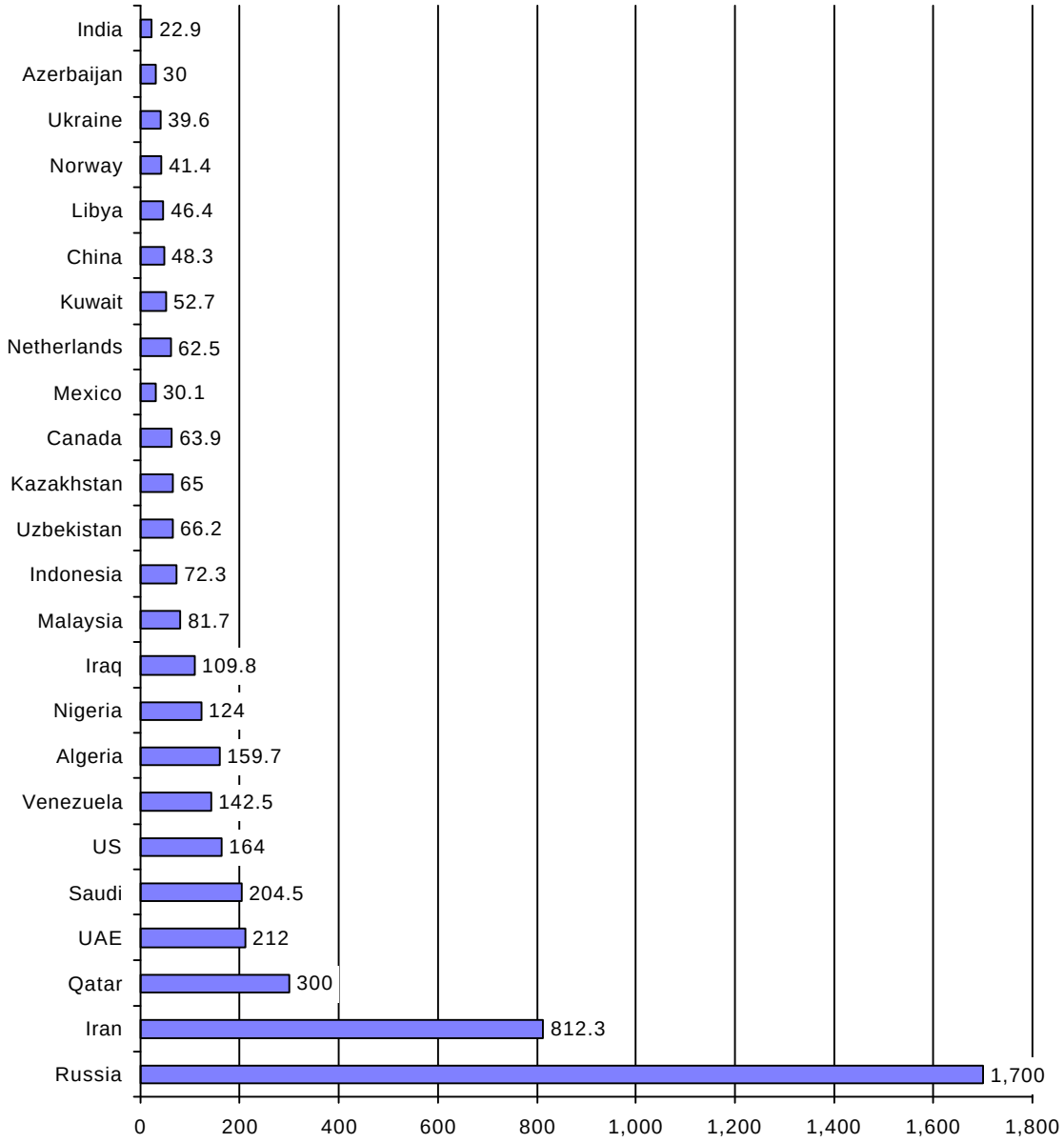
	Iran	Qatar	UAE	Saudi	Iraq	Kuwait	Oman	Yemen	Bahrain
Reserves in TCF	812.3	300	212	204.5	109.8	52.7	28.4	16.9	3.9

Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 2000, p. 20.

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Figure I-7

Percent of Total Gulf Reserves in Each Gulf Nation

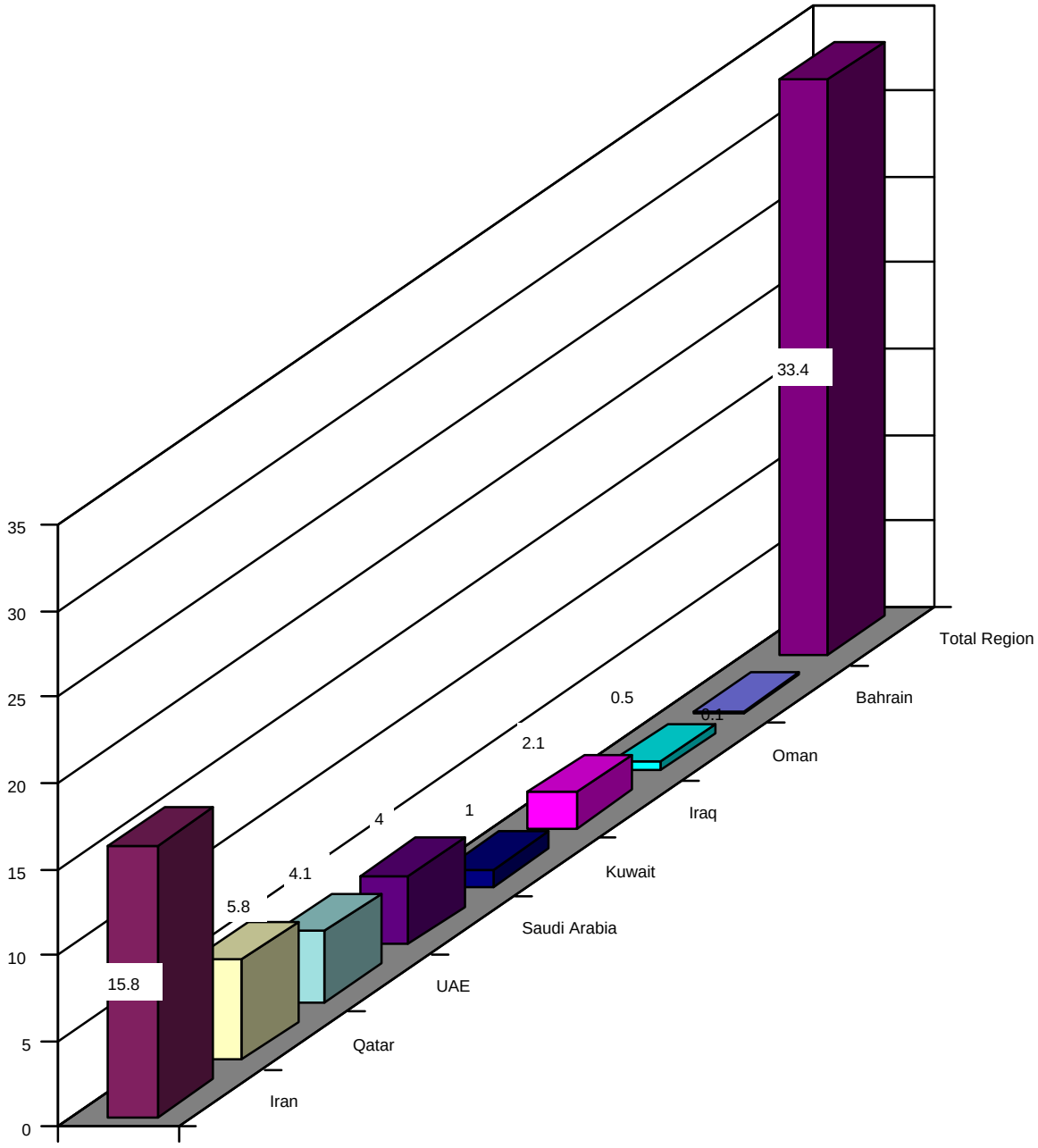


Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 2000, p. 20.

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Figure I-8

Proven Gulf Gas Reserves as Percent of Total Proved World Gas Reserves



Source: Adapted by Anthony H. Cordesman from DOE/EIA, International Energy Outlook, 2000, March 2000, DOE/EIA-0484(00), Reference Case, p. 46. Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 2000, p. 20.

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Energy Exports and Security

The basic forces driving Middle Eastern energy exports will be a combination of the policies of the individual exporting nations and market forces. In most cases, the global economy will shape most of the decision making by exporting states in regard to maintaining and expanding production capacity, the actual volume of exports, and price. It is dangerous, however, to rely on market forces as a substitute for a more comprehensive energy policy:

- There will be a natural division of interest between those nations desperate to maximize their own revenues and those interested in creating a stable, high level of demand for oil. In general, states will invest only to maximize oil revenues, not out of any theoretical considerations about the global need for energy.

- Not every exporting state will be willing to let the market decide. Iraq's invasions of Iran and Kuwait are the most blatant examples of sheer greed transformed into aggression, but states desperate to maximize revenue will also seek political ways to limit the production of other states. The need for outside and regional efforts to protect those moderate states willing to rely on market forces from political pressure and aggression will be just as great in the future as in the past.

- Violent swings in oil prices and revenues of the kind that took place between 1997 and 2000 serve no one's interest. Very low prices mean the region's chronic economic problems encourage instability and prevent adequate investment in meeting future demand. Very high prices encourage importers to turn to other sources of energy and reduce demand, and have a backlash effect in slowing economic and budget reform in the exporting nations. The idea of seeking a stable spread of prices without gross interference in the market benefits producer and consumer alike. It also allows the region to move towards a more stable form of economic development.

- The massive increases in oil and gas production and exports just outlined present another case for economic reform. Subsidized domestic oil and gas prices are a strong incentive for high levels of inefficient demand that reduces the levels available for export.

- These same massive increases will also affect the level of military security required to protect Gulf oil production and exports. Not only does nearly twice the oil and gas have to move with constant on-time predictability, most of the increase will have to move by sea and out of the Persian Gulf towards Asia. Barring the development of massive new oil ports in Iran, on the coast of Oman, or in the Red Sea, the problem of vulnerability and chokepoints will increase radically as a result of globalization.

It is important to note that geography creates several problems for Gulf security that can only be secured by the US power projection capabilities.[33] The Strait of Hormuz lies between Iran and Oman and connects the Persian Gulf with the Gulf of Oman and the Arabian Sea. A recent EIA study of strategic chokepoints notes that over 15 million barrels of oil per day flow through

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the Strait to Japan, United States, and Western Europe. The EIA calls it the "world's most important oil chokepoint," and it consists of two mile wide channels for inbound and outbound tanker traffic, as well as a two mile wide buffer zone. Any closure of the Strait of Hormuz would require use of longer alternate routes (if available) at increased transportation costs. Such routes include the five million barrels/day capacity Petroline and the Abqaiq-Yanbu natural gas liquids line across Saudi Arabia to the Red Sea, but there is no alternative route that can move all of the oil that passes through the strait and the amount of oil coming out of the Gulf will increase sharply in the future.

The Bab el-Mandab is another Strait near Djibouti, Eritrea, and Yemen that connects the Red Sea with the Gulf of Aden and the Arabian Sea. Roughly 3.3 million barrels of oil per day flow though the Bab el-Mandab to Europe, the United States, and Asia. Closure of the Bab el-Mandab could keep tankers from the Persian Gulf from reaching the Suez Canal/Sumed Pipeline complex, diverting them around the southern tip of Africa (the Cape of Good Hope). This would add greatly to transit time and cost, and effectively tie up spare tanker capacity. In December 1995, Yemen fought a brief battle with Eritrea over Greater Hanish Island, located just north of the Bab el-Mandab. The EIA estimates that the Bab el-Mandab could be bypassed by utilizing the East-West oil pipeline, which traverses Saudi Arabia and has a capacity of about five million barrels/day. However, southbound oil traffic, which totaled about 1,000,000 barrels/day in 1997, would still be blocked. In addition, closure of the Bab el-Mandab would effectively block non-oil shipping from using the Suez Canal, except for limited trade within the Red Sea region.

The Suez Canal and Sumed Pipeline through Egypt connect the Red Sea and Gulf of Suez with the Mediterranean Sea. About 3.1 million barrels a day flow through this route. The Sumed Pipeline transports 2.4 million barrels/day of crude oil northbound (2.2 million barrels/day from Saudi Arabia and Iran). The Suez Canal transports 0.7 million barrels/day. Like the closure of the Bab el-Mandab, closure of the Suez Canal and/or Sumed Pipeline would also divert tankers around the southern tip of Africa (the Cape of Good Hope), adding greatly to transit time and effectively tying up tanker capacity.

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Implications for US Energy Policy

The US has long recognized that any nation that achieved hegemony over the Gulf, that interfered with the overall flow of Gulf exports, or that produced sustained increases in the price of energy exports threatened its vital strategic interests. It has sought to develop a stable military balance of power in the Gulf ever since Britain announced its withdrawal from the region in the 1960s, and has actively deployed military forces in the region for nearly a quarter of a century.

An effective energy policy, however, requires more than providing military security and relying on market forces:

- *The US needs far more precise estimates of the global demand for Gulf oil exports and of the ability of Gulf nations to meet this demand*. Its current plans are based more on estimates of the demand for oil than the plans of Gulf states to develop the necessary production capacity and export facilities and actually produce and export at the required rates. The US may be able to rely on market forces to accomplish most of the required increase, but it must be certain that the increase will take place and have contingency plans to provide the necessary incentives and diplomatic dialogue with our Gulf allies.

- *The US needs to rethink its approach to evaluating import dependence*. It needs to analyze this dependence in terms of both direct and indirect exports, and the overall health of the global economy upon which it depends. It should shape its strategic calculations and priorities on this basis and not on the basis of direct imports.

- *The US needs to examine its military plans, and efforts to strengthen the capabilities of its allies, to see if they are adequate to defend the flow of far greater volumes of energy exports out of the Gulf region.*

- *The US needs to reexamine the vulnerability of energy production and export facilities in the Gulf in view of both the projected expansion in production and the impact of proliferation in the region.* It may need to encourage the Gulf states to expand pipeline and reserve capacity, find alternatives to reliance on tanker movements through the Strait of Hormuz, and to disperse oil facilities and make them less vulnerable to attack.

- *The US cannot shape its policy towards Iran and Iraq in terms of energy alone, but it must also face the fact that its sanctions policy cannot ignore the need for Iranian and Iraqi exports and increases in Iranian and Iraqi export capacity.*

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- *US and allied strategic reserves and stock level policy were shaped in a different environment that dates back to the Cold War*. Like the sharing agreements under the International Energy Agency they have received little high-level policy attention in recent years. The rises in oil prices in 1999 and 2000 are illustrations of the fact that this whole issue needs zero-based reexamination.

The US will also need to examine the broad economic changes taking place in the Gulf region to determine whether market forces can produce the required investment in new oil and gas production and export capacity. It needs to examine what can be done to stabilize oil prices for both exporter and importer, and it needs to shape its energy policy in terms of its relations with individual Gulf states.

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III. The Risk that Oil Wealth will Become Oil Instability and the Need to Ensure the Funding of Adequate Production Capacity

Making massive increases in Gulf production capacity requires massive amounts of capital investment at time when Gulf economies and budgets are under severe structural pressure in spite of high oil revenues. Market forces may still be enough to create the necessary new production capacity and flow of oil. However, it is far from clear that the Gulfs' exporting nations can now finance both their energy and other investments over the period between now and 2020 without (a) major efforts to repatriate domestic capital, and (b) massive transfers of foreign capital that are far larger than those that have taken place in the past.

Major structural economic reform is a partial answer, but Gulf governments must consider new measures to encourage domestic private and foreign investment in both oil and gas operations. The US and other major developed energy importing nations must encourage investment and make it clear that they are willing to support regional exporters with the necessary capital to increase their production and export capacity.

Energy Exports and Oil Wealth

Direct and indirect energy exports account for about 40% of the total export earnings of the Middle East, and vast amounts of oil revenues are involved. Even so, oil wealth is as relative as any other form of wealth. In the case of the Middle East, "oil wealth" must be measured in terms of both total national needs and per capita income. In fact, a combination of fluctuation in oil prices, high population growth rates, and a failure to modernize and diversify the overall economy now threatens to turn "oil wealth" into "oil poverty."

Massive swings in oil revenues have helped to shape to the problems the Gulf now faces. In 1972, total OPEC oil revenues were worth around $77 billion in constant 1990 dollars. After the October War and the 1974 oil embargo, they leapt to levels of around $340 billion and then

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dropped back to less than $300 billion during 1975-1978. The fall of the Shah of Iran and the start of the Iran-Iraq War drove them to a new peak in 1980, when they were worth $438.8 billion. An oil price collapse began in 1985, and revenues dropped to a low of $83 billion in 1986. They gradually rose back to levels of around $150 billion a year in early 1997, but a new "oil crash" began late that year. Oil revenues dropped back to $80 billion in 1990 dollars in 1998. [34]

Ironically, low prices then turned to high prices with equal alacrity. In March 1999, OPEC's member countries, together with some important outside producers, settled on a program of stringent oil production cuts. Following the implementation of cutbacks, the price of crude oil soared back upward over the course of 1999 and eventually reached levels not seen since the Gulf War. Revenues rose to an estimated $162 billion in 2000 in 1990 constant dollars ($132.8 billion in current dollars in 1999 and $211.5 billion in 2000.)[35] This sharp increase in oil prices was caused by several factors: 1) OPEC's March 1999, 1.7-million bbl/d quota cut agreement, in addition to over 2.5 million bbl/d in two output cutbacks agreed to earlier; 2) high levels of OPEC compliance to its quota agreement; and 3) strong world oil demand, including the rebounding Asian economies and the surging U.S. economy

The resurgence of oil revenues eased the region's short-term economic problems – -at least through 2000 as well as those of its oil dependent state budgets. Total OPEC revenues in 2000 are estimated to be 59% higher in 1999, which was a 34% rise over 1998. They will be the highest levels in real terms since 1984, and in current dollars since 1981. The problem is that such revenues will still be only 37% of their peak in 1980.[36] Moreover, the population of the Gulf has more than doubled since that time, reducing oil wealth per capita to less than one-fifth of their 1980 level.

Oil wealth is relative in other ways. A total of $211.5 billion in oil exports is scarcely small change, but this includes the total oil revenues of all OPEC states. In contrast, total world exports are worth well over $53 trillion dollars, and over $42 trillion come from developed states. East Asian exports average well over 12 trillion dollars, while total Middle East exports total only $2.1

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trillion. Oil wealth simply does not compete with balanced regional economic development by the standards of "globalism."[37]

Oil wealth also differs sharply by Gulf country, and fluctuates with time:. EIA estimates indicate that, [38]

- Saudi Arabia consistently has earned more oil export revenues than any other single member of OPEC, with the Saudi share ranging from below 20% in 1972 to over 40% in the early 1980s, and 28% today. Iran's revenue share fell after the 1978/79 Iranian Revolution (followed soon thereafter by the Iran-Iraq War for much of the 1980s), and has not recovered since.

- Iran currently accounts for about 10% of total OPEC oil export revenues, down from 17%-18% in the 1970s.

- Iraq's oil export revenue share has fluctuated sharply, from a high of around 15% in the late 1980s, to near 0% for several years following its August 1990 invasion of Kuwait (and the subsequent UN oil embargo, which continues to this day). Iraqi oil export revenues have increased over the past three years or so under the UN "oil-for-food" deal, which permits limited Iraqi oil exports to buy food and medicine, for war reparations, and for other U.N.-authorized purposes. Iraq's share of total OPEC oil revenues is now approaching 10%.

- The rest of OPEC has earned between 40% and 50% of total OPEC oil export revenues between 1972 and 1998. Around half of this was earned by "other Persian Gulf" countries, which includes Kuwait, the United Arab Emirates, and Qatar.

The key measure of "oil wealth" for any given nation is not total revenue, but the share of that revenue per person in the total population. Even with today's high oil prices, even the wealthy Southern Gulf states have only about 40% of the real per capita income they had at the peak of the oil boom in the early 1980s, and there is little prospect for anything other than a slow decline in per capita oil wealth even if oil remains at an average annual level of $30 per barrel in constant dollars. There are important exceptions. Kuwait ($22,300), Qatar ($10,300), and the UAE ($17,870) maintain high per capita incomes, but Saudi Arabia's "wealth" ($6,900) is becoming increasingly marginal, Iran has a per capita income of $1,650, Algeria has $1,520 dollars, Libya has $6,700 and Iraq's per capita income is unlikely to be higher.[39]

Many states, including virtually all Southern Gulf states, are also heavily dependent on foreign labor at a time when many of their own younger citizens lack not only jobs but also the training and work ethic to get them. In many cases, these problems are reinforced by poor

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immigration policies that are routinely violated by the toleration of illegal immigrants, the issue of visas for money, and the existence of laws that require major benefit packages for native labor, thus making it difficult to hire or fire native labor. Some countries are trying to solve the problem with erratic purges of foreign labor, but most still lack consistent policies.

The Limits of Oil Wealth

The upswing in oil prices has not wiped away the economic difficulties facing Gulf oil producers. Average oil export revenues did not climb back to their 1997 levels in constant dollars until mid-2000 because higher oil prices initially had to be achieved at the cost of lower production. Meanwhile, the fundamental dependence of Gulf economies on oil revenues remains unchanged. While the statistics on Gulf GNP's appear to reflect growing diversification, the reality is that much of the apparent diversification consists of service industries dependent on oil revenues and subsidized state industries.

The Gulf is scarcely poor relative to most of the developing world, but Gulf oil revenues have not kept pace with national budgets and population growth. This has had a serious impact on economies that have failed to modernize and diversify. These oil revenue problems have also interacted with the impact of war and revolution, and sanctions on Iran and Iraq. The end result has been tragic for Iran and Iraq, and put growing economic pressure on Bahrain, Saudi Arabia, Oman, and Yemen. This is reflected in growing investment problems, budget deficits, and cuts in entitlements and subsidies. Kuwait, Qatar, and the UAE still have a relatively high degree of oil wealth per native citizen, but Kuwait and Qatar have had to become increasingly cautious spenders.

These pressures have growth steadily for more than two decades. They posed problems for the region's oil exporters long before the "oil crash" of 1997-1998, and they remain in spite of the oil boom of 1999-2000. They are the result of years of over-reliance on oil wealth, economic mismanagement, and the failure of regional governments to realistically plan and budget for the future. Some key Middle Eastern governments have experienced 10 years of budget deficits, and

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Saudi Arabia and Iraq are key cases in point, although Saudi Arabia will most likely show a surplus this year.

Since the mid-1980's they have slowly created growing budget problems that have already led to under-investment in infrastructure, economic diversification, and state industries including the petroleum sector. Iraq and Iran are improvised by their past standards and the Southern Gulf governments no longer have all the money they need to sustain the current entitlement and welfare system. Most energy exporting economies cannot attract enough outside or internal investment to meet national needs, and their budgets in the Middle Eastern undergo consistent turbulence.

Signs of the seriousness of this issue are the fact that Saudi Arabia still faced a multi-billion dollar deficit in 1999, and Crown Prince Abdullah gave a speech in November 1998, warning that the state would have to cut social services. If low or low-to-moderate oil revenues occur again, the resulting cuts in government revenues could force many Middle Eastern countries to cut their budgets and development plans in ways that result in significant economic, social, and political tradeoffs.

The Gulf is now an economically troubled region with deep structural economic problems and serious demographic pressures. Indeed, the most recent reports and projections from the World Bank describe the entire Middle East and North Africa (MENA) region as a major economic non-competitor. During the last 35 years (1965-1998), the Middle East and North Africa averaged 3.1% annual growth in their total GNP, but per capita income rose by only 0.2%. This was the lowest figure in the world except for Sub-Saharan Africa, where per capita income dropped by 0.3%. In contrast, Asia's per capita income rose by an average of 5.7%. The next increase in the per capita income of the Middle East was 5.6%. The net increase in the developing nations of East Asia and the Pacific was 159.6%.[40]

The region experienced negative real economic growth during much of the 1980s, and economic growth only averaged about one-third of population growth during the 1990s – before

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the collapse of oil prices in 1997. The region's average per capita income rose by only 1.6% during the oil crash of 1997-1998. Although it recovered substantially in 1999 and the first half of 2000, it still seems likely that it lagged behind recovery in Asia, and in its rate of increase in real per capita income. [41] As for the north-south aspects of "globalism," the average per capita income of the Middle East is now about $2,030 using the World Bank method, and compares with $22,350 for high-income states.

One key reason for this failure to develop was the some countries failed to plan with any economic realism. An even more important factor, however, was that many did develop the right plans and reform priorities but were unwilling to act decisively to implement the plans they made.

The World Bank also projects only modest near-term improvement. It estimates real GNP growth will be 3.2% in 2001, 3.5% in 2001, and 3.4% in 1999-2008. However, the growth in per capita income will be only 1.1% in 2001, 1.5% in 2001, and 1.4% in 1999-2008.[42] This situation will certainly be better for the oil exporting states in the Gulf – but only as long as the current oil boom produces extremely high prices. The World Bank projects a significantly better mid-term future for the more diversified nations outside the Gulf that do not depend too heavily on oil – with 4.4% estimated GNP growth during 1999-2008. The oil exporting economies are only projected to grow by an average of 2.9% in spite of high oil revenues. The end result will be a net decline in real per capita income. [43] These projections also compare with an average increase in real per capita income of over 5% annually in East Asia.[44]

The Problem of Demographics

Another problem that has limited the Gulf's oil wealth is population growth. This growth has steadily reduced the amount of oil wealth per capita, and now threatens to create major problems in creating jobs and funding infrastructure and entitlements even in periods of peak oil revenues. It is interesting to consider what population growth in the Gulf region really means in terms of absolute increases in population numbers:[45]

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- Kuwait grew from 1.0 million in 1980 to 1.8 million in 1998. It is projected to grow to 82.1 million in 2015, and 3 million in 2030. It averaged 2.5% annual population growth during 1980-1998. The end result was that real per capita income decreased by an annual average of 3.0% during 1965-1998.

- Iran grew from 39.1 million in 1980 to 61.9 million in 1998. It is projected to grow to 82.1 million in 2015, and 98 million in 2030. It averaged 2.7% annual population growth during 1980-1998. The end result was that real per capita income decreased by an annual average of 1.2% during 1965-1998. [46]

- Iraq grew from 13 million in 1980 to 22.3 million in 1998. It is projected to grow to 31.3 million in 2015, and 38 million in 2030. It averaged 3.0% annual population growth during 1980-1998.

- Oman grew from around 800,000 in 1980 to 2.4 million in 1998. It is projected to grow to 3.3 million in 2015, and 4.2 million in 2030. It averaged 4.1% annual population growth during 1980-1998. [47]

- Qatar grew from around 200,000 in 1980 to 700,000 in 1998. [48]

- Saudi Arabia grew from 9.4 million in 1980 to 20.7 million in 1998. It is projected to grow to 33.7 million in 2015, and 46 million in 2030. It averaged 4.4% annual population growth during 1980-1998. The end result was that real per capita income increased by an annual average of only 0.5% during 1965-1998.

- The United Arab Emirates grew from 1.0 million in 1980 to 2.7 million in 1998. It is projected to grow to 3.7 million in 2015, and 4.3 million in 2030. It averaged 5.3% annual population growth during 1980-1998. The end result was that real per capita income decreased by an annual average of 3.6% during 1965-1998.

- Yemen grew from 8.5 million in 1980 to 16.6 million in 1998. It is projected to grow to 26.6 million in 2015, and 36 million in 2030. It averaged 3.7% annual population growth during 1980-1998. [49]

The kind of population growth will continue to put severe pressure on the economies of Iran, Iraq, Oman, Saudi Arabia, and Yemen. In the case of Iran and Iraq, these problems have will be greatly exacerbated by a heritage of revolution and war.

Water and Agriculture

Water, infrastructure, and dependence on food imports add to the region's problems. Population growth and the failure of economic reform combine to compound the Gulf's agricultural and water problems. Far too often water is often described as a problem in its own right. Water, however, is the symptom and not the disease. The region's water resources are stretched to the breaking point by several interactive factors.

- First, the failure to modernize the economies of Bahrain, Iran, Iraq, Oman, and Yemen in ways that take a much larger portion of the labor force off of the land.

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- Second, Saudi policies that waste fossil water on a vain and costly effort to achieve self-sufficiency in food production.
- Three, the waste of large amounts of water on showpiece parks and urban areas in the UAE.
- Fourth, the failure to price water and many other commodities and services at a market price and force efficiency.
- Fifth, the inevitable problems trying to divide finite amounts of water – some of it fossil and unrenewable – among a population projected to increase by more than three times between 1980 and 2030.

The end result is already alarming. The arable hectares per capita have dropped from 0.29 in 1979-81 to 0.21 in 1995-1997, a drop of nearly 30% in about 15 years. At the same time, water consumption rose as the amount of irrigated land rose from 26% of cropland to 36%. The average annual rate of growth in Middle Eastern and North African agricultural output dropped from 5.5% during 1980-1990 to 2.5% during 1990-1998.[50]

It the case of the Gulf, population problems make the region heavily dependent on food imports and massive expenditures on water where the nations is wealthy enough to make such purchases, and major water shortages where the money is not available to invest in desalination. Agriculture and fishing have become a negligible portion of the Bahraini, Kuwaiti, and Qatari economies, and employ less than 1% of the labor force, and virtually all water must now be desalinized or imported. Oman is seriously straining its aquifers, and its badly outdated agricultural sector employs 37% of the labor force and consumes large amounts of water to produce only 3% of the GNP.

The two most heavily populated states in the Gulf -- Iran and Iraq are both major food importers -- although agricultural activity accounts for 21% of the Iranian GNP and a large amount of Iraq's impoverished economy. Both nations face major future water problems.

Saudi Arabia relies heavily on desalination, but it still heavily subsidizes water-intensive agriculture. It does so in spite of the fact that agriculture accounts for only 6% of the GNP, the Kingdom remains a massive net food importer, and much of the 6% of the labor force employed in agriculture is now foreign.[51] The UAE still has some agriculture, mostly subsidized or in the

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poorer eastern emirates, but now uses more water on parks than crops. No reliable statistics exist on Yemen, but its agricultural sector is now largely drug-driven and its water problems are a result of urban demand.

"Regional Youthening" versus "Global Aging"

The combination of economic problems and population growth threatens the Gulf in other ways. One is that rapid population growth has produced a regional "youth explosion" at a time when developed nations like the US, the EU states, and Japan are worrying about "global aging." Roughly 40% of the Gulf's population is now under 14 years of age. The figures are 43% in the case of Iran, 44% in the case of Iraq, 41% in Oman, 43% in Saudi Arabia, and 48% in Yemen, even if one allows for large amounts of foreign labor in several of these countries.[52] The region's educational system is under extreme stress, and real and disguised unemployment for males between 18 and 25 years probably averages over 25%.[53]

This kind of youth explosion would be a potentially explosive situation at any time, and it is compounded by weaknesses in the education system, and gross over-employment in meaningless or low productivity jobs in the state sector. In most countries it is compounded by a lack of housing, the high cost of marriage, and education which is not focused on producing men and women trained to be productive enough to be globally competitive. This youth explosion places a major burden on the extended family in the Middle East, and makes youth a natural target for extremism of all kinds.[54]

In most Southern Gulf countries, these problems are made worse by over-reliance on foreign labor. Bahrain is relatively poor, but 37% of its population is still foreign. Over 31% of the population of Kuwait is foreign, 75% in Qatar, 27% in Saudi Arabia, and 76% in the UAE.[55] Almost all of this expatriate labor displaces native labor from the work force and exports large amounts of capital out of each country. In the case of many of the richer oil states, native labor cannot compete with low cost imported labor and has no desire to do so. A heritage of real oil

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wealth, inflation expectations, inadequate education, and status problems does not create the kind of work ethic that seeks out low paying jobs.

These pressures affect political stability in other ways. They are contributing to the slow breakdown of the region's traditional family, clan, and tribal system, which is based on villages and the extended family, in ways that have nothing to do with the Internet and bad Western television and movies. This is not to say that the extended family is failing, but it is under increasing strain.

Population growth, a lack of agricultural modernization, and a lack of development planning also interact to push people of all ages into cities. The percent of urbanization in the total population of the region rose from 37% in 1970 to 57% in 1996, and will probably rise to well over 70% by 2020.[56] Hyperurbanization in areas with a population of over one million has risen from 17% of the total population in 1980 to 21% in 1998, and is projected to reach 24% in 2015.[57] An average of more than 25% of the population of each Middle Eastern country lives in its single largest city, and this percentage is higher in most key exporting countries in the Southern Gulf.[58] Urbanization have many advantages as a global trend, but in far too many cases in the Middle East, it is occurring without enough development to guarantee urban jobs, and a lack of proper infrastructure and housing intensifies the region's problems.

The Decapitalization of the Gulf

Structural economic problems, war, and massive swing in energy prices and the attractiveness of energy investments have kept the Gulf from being competitive in attracting global capital and in retaining its own domestic savings. It is fine to talk about the new global efficiency of capital flows, but one aspect of this efficiency is that domestic capital goes where it is safe and gets the maximum yield. There is some $500-800 billion in private regional capital holdings outside the region, and many wealthier governments invest in the West. More than half of this capital comes from the West.

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This does not mean that some foreign capital has not flowed into the Gulf. The World Bank estimates that net foreign direct investment in the region rose from $300 million in 1970, and $2.5 billion in 1990, to $8.1 billion in 1999. However, this figure covers the entire Middle East and scarcely compares with the outflow of direct investment, however, and the comparative total for net foreign direct investment in Latin America was $89.4 billion in 1999, and $61.5 billion in East Asia and the Pacific.[59]

If one looks at total net resource flows for domestic, foreign private and government capital to the Middle East during 1997 – before the oil crash hit – the total was less than $7 billion because of official outflows like debt payments. In contrast, the total inflow to East Asia was $122 billion. It was $116 billion for Latin America, and $14.6 billion for South Asia.[60]

Declining Global Trade Share

Increases in oil trade do not substitute for economic diversification. The Gulf and the entire Middle East have lagged badly behind the fastest developing regions in terms of relative growth in world trade. Pan-Arabism now has little or no meaning in terms of "regionalism." Every major Gulf State now trades largely with states outside the region, and has done so for decades. Interregional trade has declined as a share of total trade for nearly a quarter of a century.[61]

Directly comparable statistics are only available on a regional basis, rather than for the Gulf but their implications are clear. If one looks at the most recent year for which directly comparable statistics are available, the entire Middle East and North Africa accounted for only 2.3% of world trade, including all oil and gas revenues. Only 8.6% of this trade was with other Middle Eastern states.[62] Put differently, Middle Eastern exports totaled $205.7 billion in current dollars in 1980, and $192.4 billion in 1999. East Asia exports grew from $252.8 billion in the much shorter period from 1990 to $698.7 billion during 1990 to 1999, or by a factor of 2.8.[63]

The Middle East has lagged badly in terms of export growth during the last decade (1987-1997). Its exports grew at an average annual rate of only 5.3% during 1987-1997. This compared

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with 13.2% for East Asia, 10% for South Asia, and 6.4% for Latin America.[64] This is scarcely surprising given its agricultural problems and the fact that its growth in manufacturing output and industry was only about one-fifth to one-third that of East Asia.[65]

The Middle East has also lagged badly behind other developing regions in terms of export volume as a percent of total goods and services, and this is unlikely to change in the future. The World Bank projects growth rates of around 4% during 1999-2000, versus 8.0% for East Asia, 6.5% for Latin America, 7.7% for South Asia,[66]

The non-petroleum related exports of the Middle East have steadily shrunk as a percent of total world trade for nearly forty years -- except for brief bursts during periods of very high oil revenues. While some individual Gulf states are doing significantly better than the average for the entire region, only Sub-Saharan Africa has a lower rate of growth in share of world trade. [67]

Ability to Fund Investment to Increase Oil and Gas Production

The uncertainties surrounding future demand and future oil and gas export revenues affect more than internal and regional stability. They may be creating serious long-term problems in forecasting the rate of increase in Middle Eastern oil and gas production capacity. Two critical factors are involved. One is the impact that reduced revenues and problems like the “oil crash” have had on the budgets and investment capabilities of Middle Eastern oil exporting states. The second is the slowly increasing social and structural problems caused by rising populations, high welfare and entitlement programs, high military and arms expenditures, and low long-term revenues.

Saudi Arabia, for example, experienced a 7% cut in its GDP during 1998. It began to increase prices in key subsidized areas like electricity in November 1998, and future deficits were feared. It was forced to steadily cut the level of investment expenditures in its budget to pay for operating expenditures. The rise in oil revenues cut the deficit in 1999 and should produce a surplus in 2000. This will not solve Saudi Arabia’s problems in funding its new five year plan,

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however, and population growth is outpacing the average growth in oil revenues. Even if oil prices remain high after 2002, Saudi Arabia will face a demographic bulge that will make it very difficult to find all the funds it needs for investment. [68]

Iran has had serious economic problems ever since the end of the Iran-Iraq War. Iran could only solve its funding problems in 1998 because of $3.0 billion in debt refinancing, by accepting a $6.0 billion budget deficit, and by paying for 1998's food imports with part of 1999's oil exports. Qatar, the UAE, and Oman faced major cash flow problems, which forced them into near-term cutbacks in some key energy projects while trying to find long-term solutions through foreign investment. Oman and Qatar's gas-based export programs, however, faced serious financing problems, potential delays, and downsizing. [69]

Most Gulf states have been relatively successful in using state revenues to fund energy investments in the past. It now seems likely, however, that foreign and domestic private investment must assume a much larger share of the burden if the region is to produce anything like the energy output projected in DOE and IEA estimates. Relying on market forces may still lead to enough cost-effective investment, particularly given the oil industries history of investing in reserves, future market share, and development even in periods of low oil income. However, the era of being able to rely on oil and gas revenues to fund state maintenance and modernization may well be over.

Gulf governments do not need to abandon state industries, state investment, and state control over energy resources, but fundamental reforms are needed to increase the ratio of foreign and domestic private investment. There currently is no Gulf country where market forces are allowed to operate freely without serious state interference although Saudi Arabia and Kuwait are liberalizing and Bahrain, Qatar, Oman and the UAE – are making serious progress. Nearly all oil producing countries in the Gulf are also currently examining ways in which to privatize some aspects of its energy investment and obtain foreign investment.

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At this point in time, however there is no meaningful way to establish which energy exporting countries will persist in their reform plans, how successful they will be in developing the investment and economic reform plans they need, and how well their investments will be managed. Gulf regimes tend to back-peddle on reform when oil revenues rise, and many countries face resistance from nationalists, Pan-Arab socialists, state-oriented technocrats, traditionalists, and Islamists. Virtually all energy-exporting states want to maximize revenues, but also have powerful elements that want to conserve resources for the future.

The Gulf Must Cure a Self-Inflicted Wound

Dealing with this complex mix of structural challenges is a difficult problem for policy and there is only so much that the US can do. The Gulf's economic and demographic problems are largely a self-inflicted wound. They are not the product of colonialism or occupation. Nations in other regions -- which faced far more serious burdens and which once had a far less well-developed economic base -- have prospered.

They are not the product of regional tensions and war. Taiwan and South Korea are two examples of nations shaped by war and that developed in spite of having to maintain massive levels of defense spending. They are not the product of a lack of democracy and the failure to accept Western concepts of law and human rights. Each of Asia's "tigers" achieved high levels of development before any major political liberalization took place. They are not the result of discriminatory policies or conspiracies, regardless of how fashionable they may be in the region.

The Gulf and the Middle East have failed to compete globally as a region almost solely because of the failures of its own governing and intellectual elites. No one inflicted war or economic waste on the Gulf. Where valid economic policies have been pursued, the results have been just as effective as in other parts of the world. Where unworkable concepts of Arab socialism, industrial development, patriarchal welfare have been applied, they have failed – sometimes in spite of massive initial oil wealth. Corruption, nepotism, political squabbles, and civil conflict cannot be blamed on anyone else. Economic aid, and heavy state borrowing have largely

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been wasted, and often been wasted by the fact that governments have used the money to defer reform and effective action. With the exception of a few nations – including an Islamic Iran – population control has been ignored or dealt with through ineffective lip service.

These are scarcely points that any Gulf leader can claim to be unaware of, or which are raised only from the outside by Western scholars. Crown Prince Abdullah of Saudi Arabia has made them forcefully over the last two years. Iran explicitly recognized most of these problems in is 1999 economic reform plan. The current five-year plans of Bahrain, Oman, Qatar, and Saudi Arabia all touch on many of these issues. The Gulf region has many highly competent technocrats, analysts and economists and some have raised these issues for decades, while others have written one competent economic reform plan after another. It should be clear, however, that there is nothing about "globalism" and market forces per se that will change this situation. The Internet, global financial networks, and multinationals act to reward success, not failure. No one can compel even the region's citizens, much less outsiders, to misinvest their money in spite of the return on investment and the risk.

Implications for US Policy

The most useful single thing that the US government, and American corporations and experts, can do to ensure adequate supplies of energy is analyze these problems in detail and tell the region the truth. It needs to work quietly with each of its Gulf allies to encourage them to actually act on their economic reform plans and efforts to reduce their dependence on foreign labor. It needs to start a careful dialogue to encourage the Gulf states to take a much harder look at their population policies and educational structures – paying close attention as it does so to cultural and religious sensitivities.

There are four additional areas where US policy needs to be improved.

- *Governments cannot dictate the price of a global commodity. They may, however, be able to influence the market by taking cooperative steps to keep prices from cycling from one extreme to another, and within a moderate band of prices that meet the needs of exporter*

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and importer alike. Violent swings in oil policy do not serve either exporter or consumer interest. Prices that are too high can drive importers to use alternative sources of energy and reduce mid and long-term demand. They discourage economic reform, and can discourage effective investment in new production capacity because it is seen as unnecessary. They create major political tensions between the US and its Southern Gulf allies and undermine support for American power projection. Prices that are too low make it impossible for Gulf states to fund the needed increases in energy export capacity and threaten the internal stability of each Gulf state. They also encourage extremism in Iran and Iraq.

- *An ongoing dialogue over price stability between OPEC and the OECD is one possible approach to the problem*. A close ministerial-level dialogue between the US and key Gulf allies like Saudi Arabia, Kuwait, and the UAE is a virtual necessity. The last four years have shown that simply passively reacting to market forces is not enough.

- *An importer-exporter dialogue is also needed on expanding production capacity in the Gulf and ensuring the necessary flow of investment.* Market forces may be able to ensure the necessary level of investment in increased energy export capacity projected by the EIA, and virtually every other official source of such projections. However, the Gulf now has many barriers to investment. The sheer scale of increase in Gulf exports and production capacity projected by the EIA -- and projected in near identical form by OPEC and the International Energy Agency – raises serious questions about the effectiveness of market forces to solve these problem without a clear consensus between the exporting and importing nations, and new arrangements to provide the necessary investment. The kind of dialogue that Crown Prince Abdullah started with foreign investors in late 1998 should almost certainly be followed by a major US effort to create a continuing dialogue with its Gulf allies over energy capacity and investment.

- *The US needs to know what it takes to ensure the need expansion of energy exports from the Gulf.* Unfortunately, an examination of current estimates of energy investment costs indicates that there is no clear way of estimating future regional and country-specific investment requirements beyond relatively near term projects. One imperative goal for US policy making is to give this kind of "what if" modeling high priority. It is then to consider just how much investment and reform is needed in each key producer country if it is to sustain and expand its petroleum production capacity to the level the world needs.

- *Dialogue is needed to ensure suitable surplus production capacity is maintained along with increases in production capacity,* Saudi Arabia's current status as a "swing producer" with sufficient surplus capacity to make up for most foreseeable shortfalls is not guaranteed in the future, and requires a level of investment that can only be maintained as an act of deliberate policy. Iraq's current ability to threaten world markets is an example of the risks inherent in any situation where actual production comes too close to total

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production capacity, and the world cannot afford to be held hostage by a single producer in the future.

- *The US, other major importers, and major exporters need to rethink the issue of oil reserves.* One policy conclusion that emerges from many of the following chapters as well is the need to create significant oil and other energy reserves as a protection against miscalculations over demand and weather, and political and military crises. Market forces may well drive individual firms to be too efficient in reducing stocks and inventory, and make on time delivery into a strategic risk. The creation of large strategic petroleum reserves has faltered over the large decade. Equally important, insufficient regulation exists to ensure that private suppliers have sufficient stocks to buffer them against real world swings in supply and demand.

The 1990s may have been a decade where the world could rely largely on market forces, give or take a major war. Nothing about the future indicates that the US will not need a far more proactive energy policy. The US must work with market forces and largely rely upon them. It cannot, however, rely fully on the market place – particularly where the market has little or no incentive to pay for America's security.

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IV. The Importance of Southern Gulf Allies

US policy towards the Gulf may be dominated by the need the US and global economy has for energy, but it can only be successful if it recognizes that each Gulf state is a sovereign nation with its own needs, and priorities. The US is fortunate that each Southern Gulf state is now both an ally and a partner. Maintaining this partnership is a key aspect of US regional strategy, and the US must shape its diplomacy, energy policy, and military plans and commitments accordingly.

Ideally, the Southern Gulf states, could play a much larger share in maintaining their own security, and do so through collective security efforts like the Gulf Cooperation Council (GCC). Figures IV-1 through IV-4 show that the Southern Gulf states make major military expenditures. Figures IV-5 to IV-10 show that they have also made truly massive arms imports in recent years which have far outpaced those of Iran and Iraq.

There are, however, certain facts of life in the Gulf that push Saudi Arabia and all of the other Gulf states towards a high degree of bilateral dependence on the US:

- The Southern Gulf states are all members of the Gulf Cooperation Council (GCC), which was formed in 1980. This sometimes leads Americans to treat the GCC as a potential NATO, and as a strong foundation for collective defense. In practice, it has always been militarily weak, and Gulf leaders have shown little interest in what have often been good plans to improve military cooperation in creating effective rapid deployment forces, common air defense, and common maritime surveillance. There has been real progress, but it has been grindingly slow and so far has not reach the need of a major commitment to collective security. The GCC is a political reality, but it is still largely a military myth.

- Internal rivalries between the Southern Gulf states continue to divide them, and block full cooperation on sensitive security issues. Saudi Arabia's very size and strength – and its history as a state King Ibn Saud forged by war – make its smaller neighbors worry about its power and influence and fear its hegemony. Saudi Arabia has done much to reduce these tensions, but it has never had warm relations with Kuwait and some low-level tensions remain between Saudi Arabia and Qatar, the UAE, Oman, and Yemen. The UAE is particularly concerned because the Saudi rapprochement with Iran has weakened Southern Gulf solidarity in opposing Iran's claim to total sovereignty over three islands near the main shipping channels in the Gulf: Abu Musa and the Greater and Lesser Tunbs.

- The Gulf is a large region and does not share a unity of strategic interests. Upper Gulf states like Kuwait, Bahrain, and Saudi Arabia naturally see Iraq as a major threat. Lower Gulf states like Oman and the UAE focus on Iran. Qatar seeks to minimize the threat from both. Oman and Saudi Arabia have common borders with Yemen, and see Yemen as a continuing concern. Oman has important

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strategic interests in the Indian Ocean and Gulf of Oman, and Saudi Arabia is a Red Sea power. The US sometimes tends to talk about the Southern Gulf states as a strategic bloc. They are not, there is no reason for them to be, and they will never act of some vague, theoretical concept of collective interest.

- There is a school of Gulf intellectuals and Western Arabists that advocate the creation of regional security structures and US withdrawal – over the horizon at a minimum, but total if possible. This is a political and ideological fantasy as long as Iran and Iraq present real potential threats. At the same time, there is real opposition to Southern Gulf military ties to the US at many different levels – ranging from Pan-Arabism to Islamic extremism. The US cannot avoid these political realities. It can only attempt to reduce them by taking full account of political, religious, and cultural sensitivities; making a major and continuing effort to explain and justify its presence, showing that it treats its allies as partners, and minimizing its forward presence.

- Nations like Egypt and Jordan can play an important strategic role in Gulf security. It is one of the ironies of Pan-Arabism, however, that there is considerable distrust of both Arab states in much of the Southern Gulf, and far more confidence that the US will not interfere in local politics. It is also a military reality that other Arab states have limited warfighting technology by American standards, and are not structured for power projection. An effort was made at the time of the Gulf War, called the Damascus Declaration, to link the GCC states and Egypt and Syria. It foundered because (a) the GCC states were fully aware of the military limitations in other Arab states, (b) their political concerns with having other Arab states present on their soil, and (c) their refusal to provide major aid packages to pay for low capability military forces. None of these realities have changed.

- Europe can play a role in the Gulf. However, Britain is the only nation that has shown a real will and capability in doing so, and it has limited power projection capabilities. France experienced major problems in deploying and fighting during the Gulf War, and other European states played a peripheral role in the air war and would not commit their mine warfare ships to combat. In spite of the rhetoric surrounding the European Defense Initiative, European power projection capability and will is very limited and likely to remain so.

The Gulf Cooperation Council does provide a useful political and security forum, and some progress has been made in holding common military exercises and in dealing with internal security issues. However, phrases like “collective security” and “coalition warfare” describe useful political efforts to create a united effort to deter and end aggression in the Gulf, but they are only very limited military realities.

Accordingly, the key to successful security policy is US success in bilateral relations between the US and each of its individual Southern Gulf allies. The US must also be sensitive to the fact that while no Southern Gulf state may be a democracy, each has a high degree of legitimacy in terms of responding to the feelings and needs of its own peoples. This means the US must also respond to important national, cultural, and religious sensitivities. The US cannot afford to lecture any of its allies, it must work with them

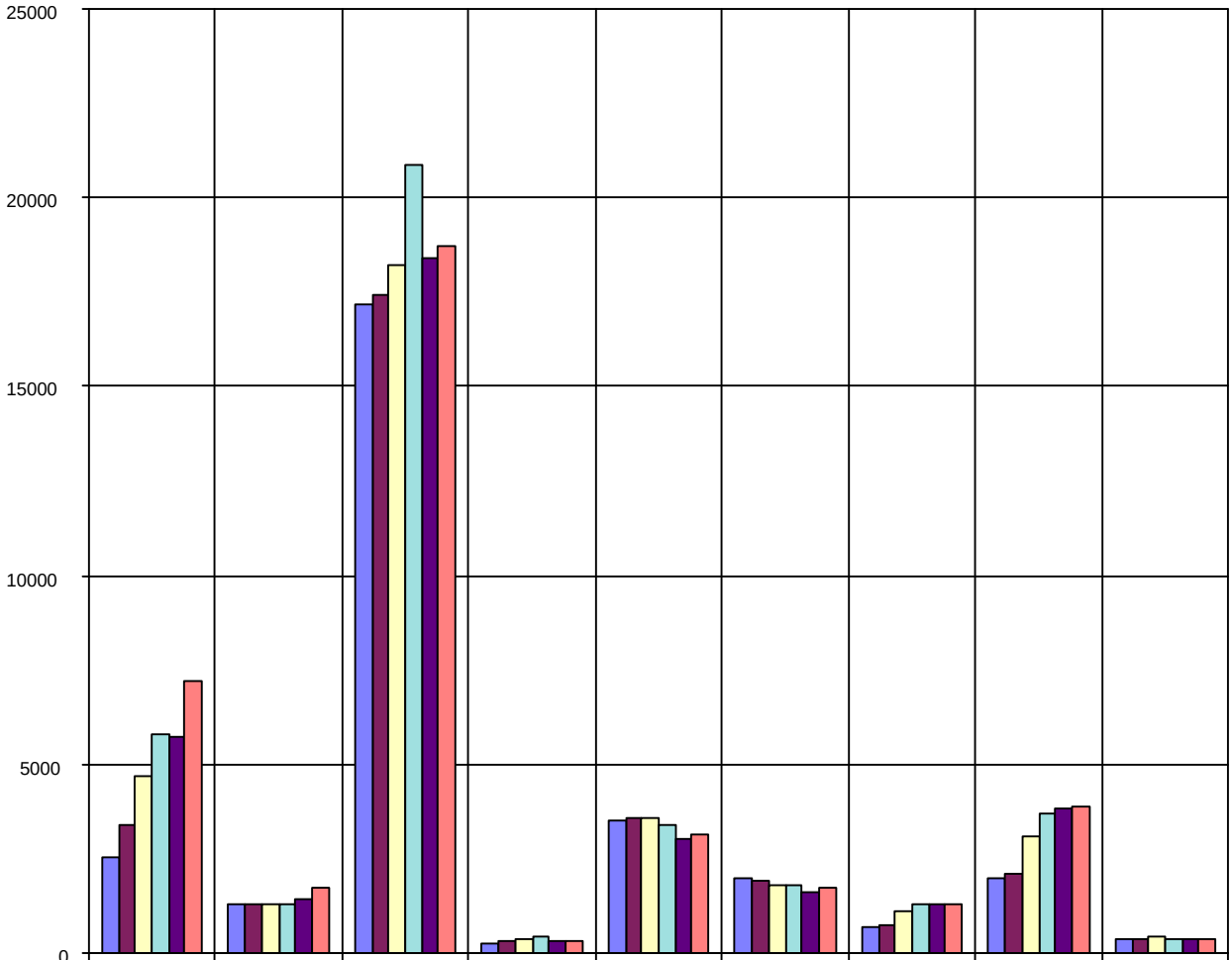
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Figure IV-1

Gulf Military Expenditures: 1997-2000

($Current US Millions)



	Iran	Iraq	Saudi Arabia	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
1995	2500	1300	17200	273	3500	2000	700	2000	345
1996	3400	1300	17400	285	3600	1900	755	2100	362
1997	4700	1300	18200	364	3600	1800	1100	3100	411
1998	5800	1300	20900	402	3400	1800	1300	3700	396
1999	5700	1400	18400	306	3000	1600	1300	3800	374
2000	7200	1700	18700	317	3170	1750	1300	3900	381

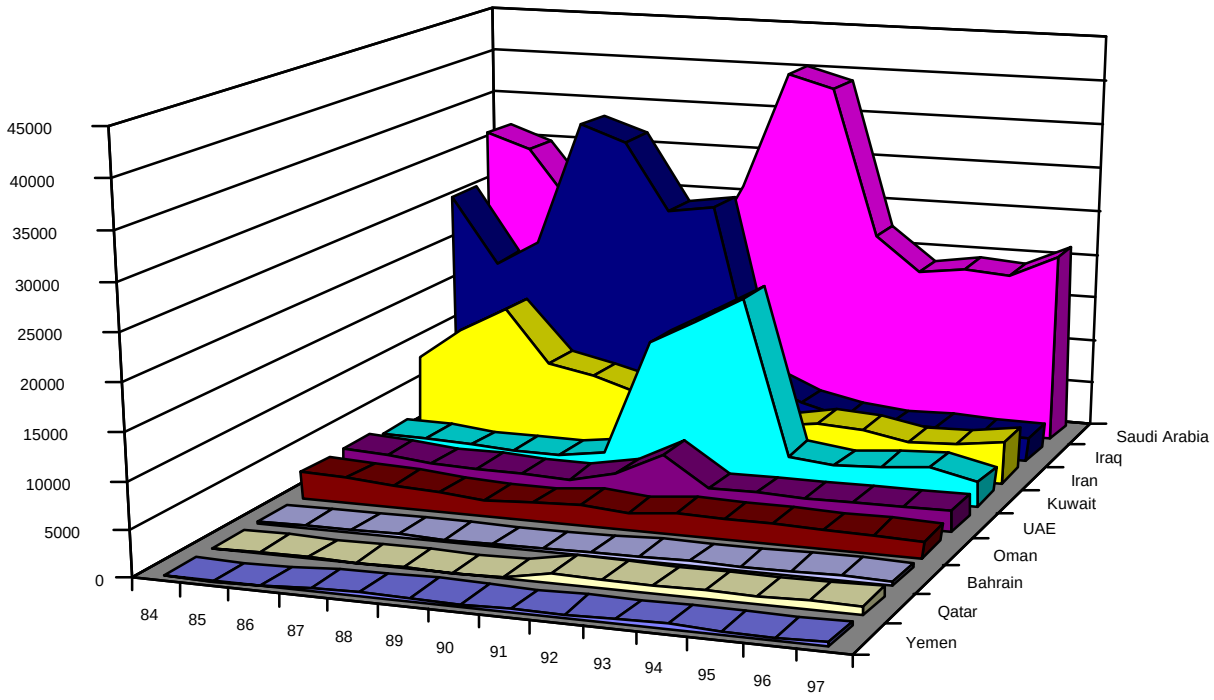
0 = less than $50 million or nil, and all data rounded to the nearest $100 million.
Source: Estimated by the author using IISS, CIA, and country data.

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Figure IV-2

Comparative Military Expenditures of the Gulf Powers - 1983-1997

($97 Constant Millions)



	84	85	86	87	88	89	90	91	92	93	94	95	96	97
Yemen				369	445	474	372	403	430	431	536	419	379	411
Qatar	115	127	120	145	119	111	209	1060	894	865	895	905	992	976
Bahrain	220	206	214	214	237	238	253	315	514	505	508	519	531	533
Oman	2970	2785	2360	2020	1710	1890	2230	1890	2230	2060	2130	2080	1940	1820
UAE	3025	2700	2220	2120	2010	1930	3030	5550	2330	2290	2270	2250	2250	2310
Kuwait	2290	2150	1790	1630	1560	2310	1520	1780	2070	3810	3190	3550	3900	2760
Iran	8900	1230	1510	9350	8330	6820	7160	6710	4170	4950	4770	3640	3940	4730
Iraq	2560	1820	2100	3500	3320	2550	2640	6698	4430	3280	2880	2880	2680	2680
Saudi Arabia	3150	2980	2350	2160	1720	1790	2710	4020	3880	2210	1840	1910	1880	2110

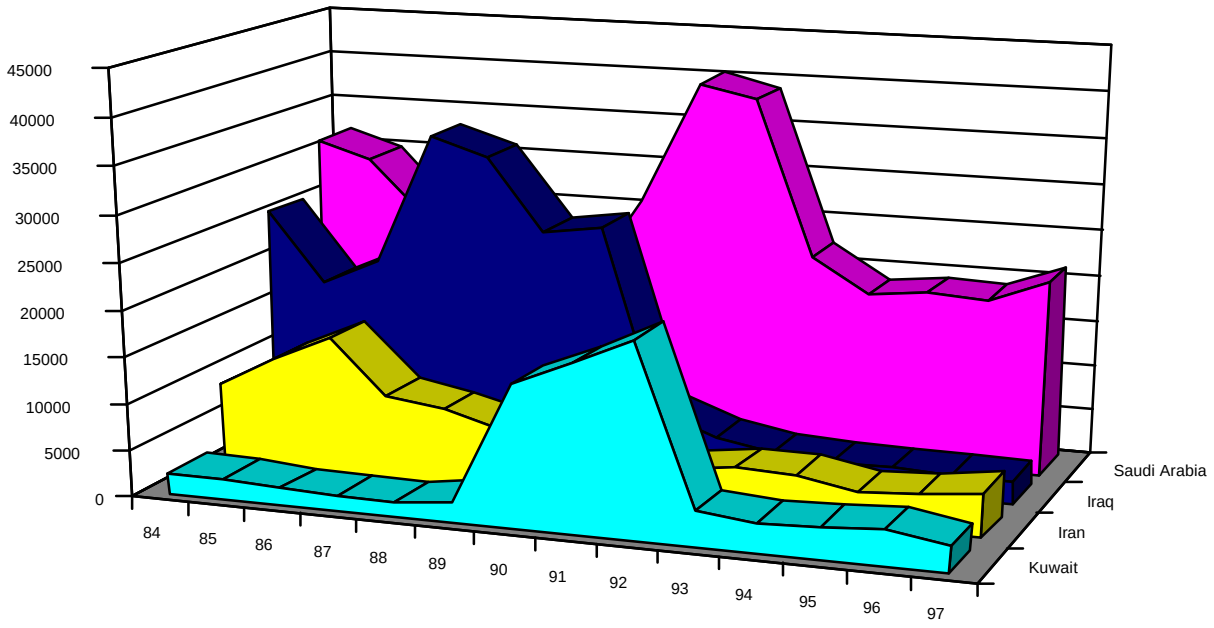
Source: Adapted by Anthony H. Cordesman from US Arms Control and Disarmament Agency, World Military Expenditures and Arms Transfers, , GPO, Washington, various editions.

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Figure IV-3

Comparative Military Expenditures of the High Expenditure Gulf Powers: 1983-1997

($97 Constant Millions)



	84	85	87	88	89	90	92	93	94	95	97
Kuwait	2290	2150	1630	1560	2310	15200	20700	3810	3190	3550	2760
Iran	8900	12300	9350	8330	6820	7160	4170	4950	4770	3640	4730
Iraq	25600	18200	35000	33200	25500	26400	4430	3280	2880	2880	2680
Saudi Arabia	31500	29800	21600	17200	17900	27100	38800	22100	18400	19100	21100

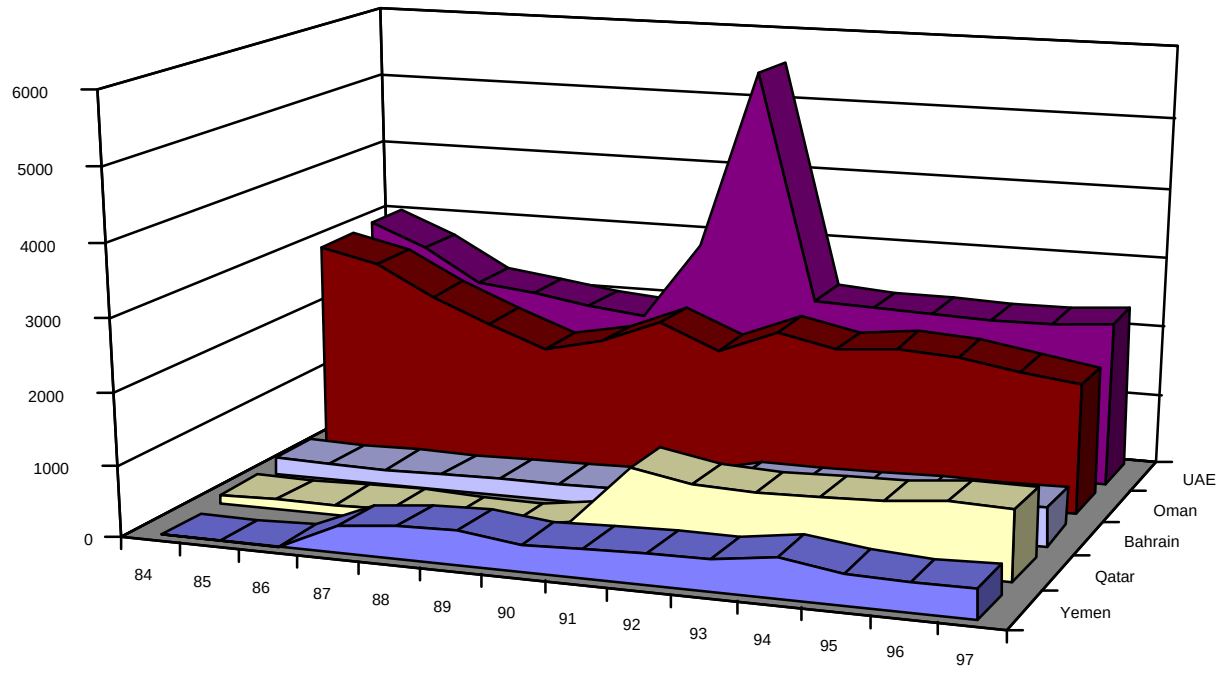
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Figure IV-4

Comparative Military Expenditures of the Smaller Gulf Powers: 1983-1997

($97 Constant Millions)



	84	85	86	87	88	89	90	91	92	93	94	95	96	97
Yemen				369	445	474	372	403	430	431	536	419	379	411
Qatar	115	127	120	145	119	111	209	1060	894	865	895	905	992	976
Bahrain	220	206	214	214	237	238	253	315	514	505	508	519	531	533
Oman	2970	2785	2360	2020	1710	1890	2230	1890	2230	2060	2130	2080	1940	1820
UAE	3025	2700	2220	2120	2010	1930	3030	5550	2330	2290	2270	2250	2250	2310

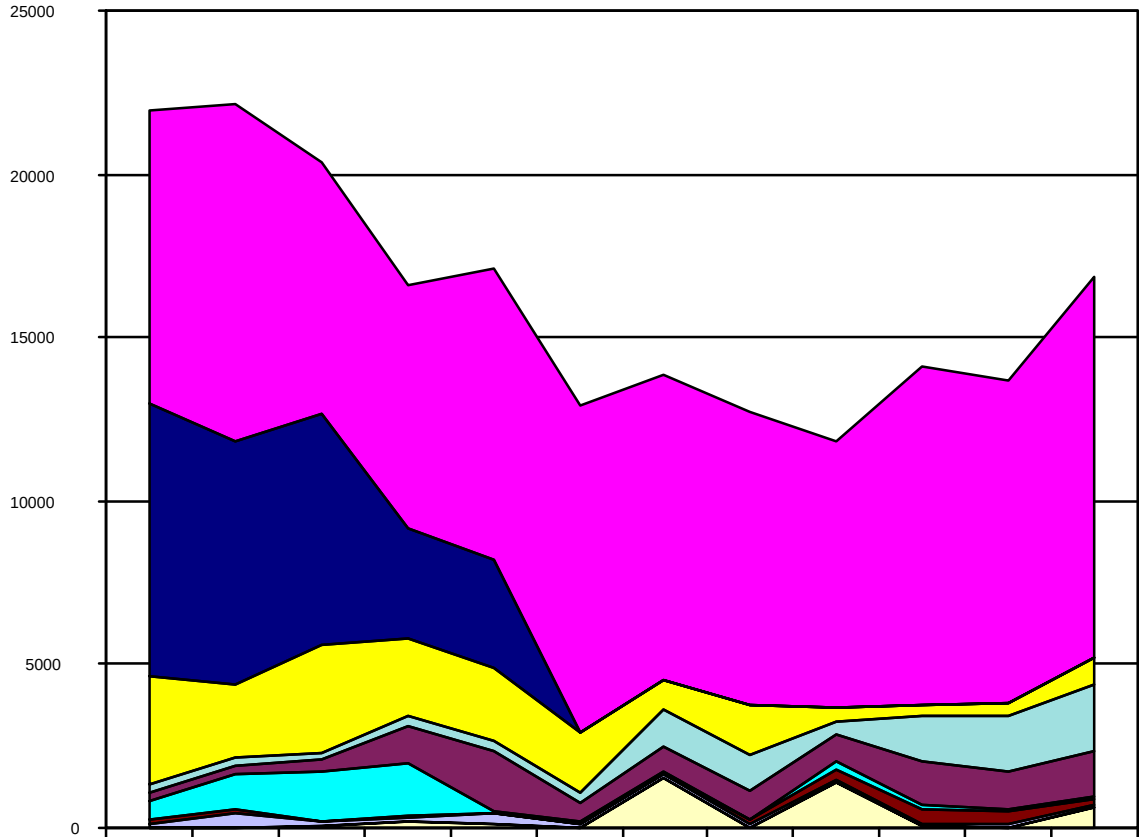
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Figure IV-5

Cumulative Arms Imports of the Gulf States - 1984-1997

(Value of Deliveries in Constant $1997 Millions)



	86	87	88	89	90	91	92	93	94	95	96	97
Saudi Arabia	8978	10320	7710	7423	8900	9968	9312	8962	8143	10350	9862	11600
Iraq	8288	7448	7078	3407	3279	0	0	0	0	0	0	0
Iran	3305	2221	3286	2312	2225	1812	942	1512	412	342	356	850
Kuwait	271	248	152	316	316	374	1109	1080	412	1346	1728	2000
UAE	247	261	404	1187	1874	532	804	891	793	1346	1118	1400
Yemen	564	1045	1523	1554	35	41	6	22	275	145	81	110
Oman	178	157	38	73	12	57	11	140	307	445	376	160
Bahrain	91	418	126	97	328	79	122	86	106	72	132	90
Qatar	7	12	38	219	117	23	1552	11	1375	52	5	625

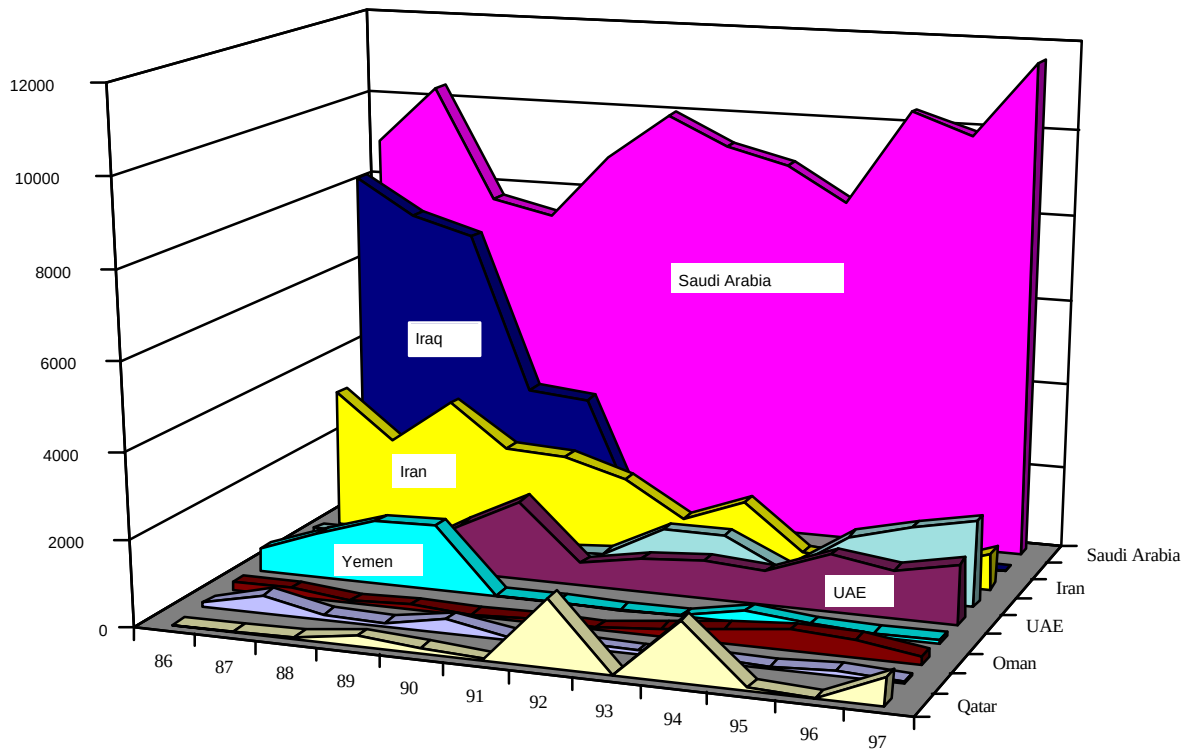
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Figure IV-6

Comparative Arms Imports of the Gulf States – 1986-1997

(Value of Deliveries in Constant $1997 Millions)



	86	87	88	89	90	91	92	93	94	95	96	97
Qatar	7	12	38	219	117	23	1552	11	1375	52	5	625
Bahrain	91	418	126	97	328	79	122	86	106	72	132	90
Oman	178	157	38	73	12	57	11	140	307	445	376	160
Yemen	564	1045	1523	1554	35	41	6	22	275	145	81	110
UAE	247	261	404	1187	1874	532	804	891	793	1346	1118	1400
Kuwait	271	248	152	316	316	374	1109	1080	412	1346	1728	2000
Iran	3305	2221	3286	2312	2225	1812	942	1512	412	342	356	850
Iraq	8288	7448	7078	3407	3279	0	0	0	0	0	0	0
Saudi Arabia	8978	10320	7710	7423	8900	9968	9312	8962	8143	10350	9862	11600

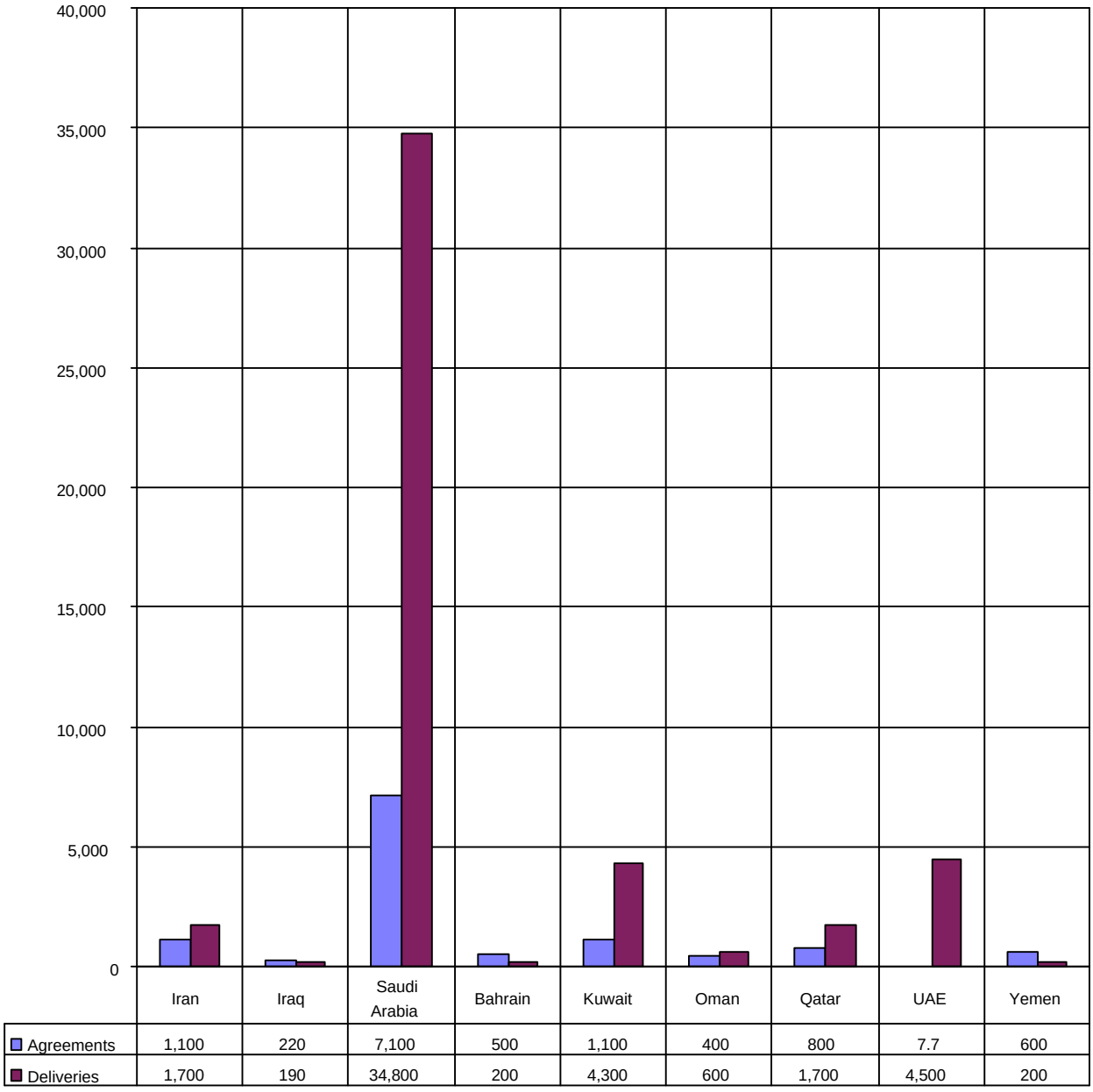
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Figure IV-7

Total Gulf New Arms Agreements and Deliveries 1996-1999

($Current US Millions)



	Iran	Iraq	Saudi Arabia	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
Agreements	1,100	220	7,100	500	1,100	400	800	7.7	600
Deliveries	1,700	190	34,800	200	4,300	600	1,700	4,500	200

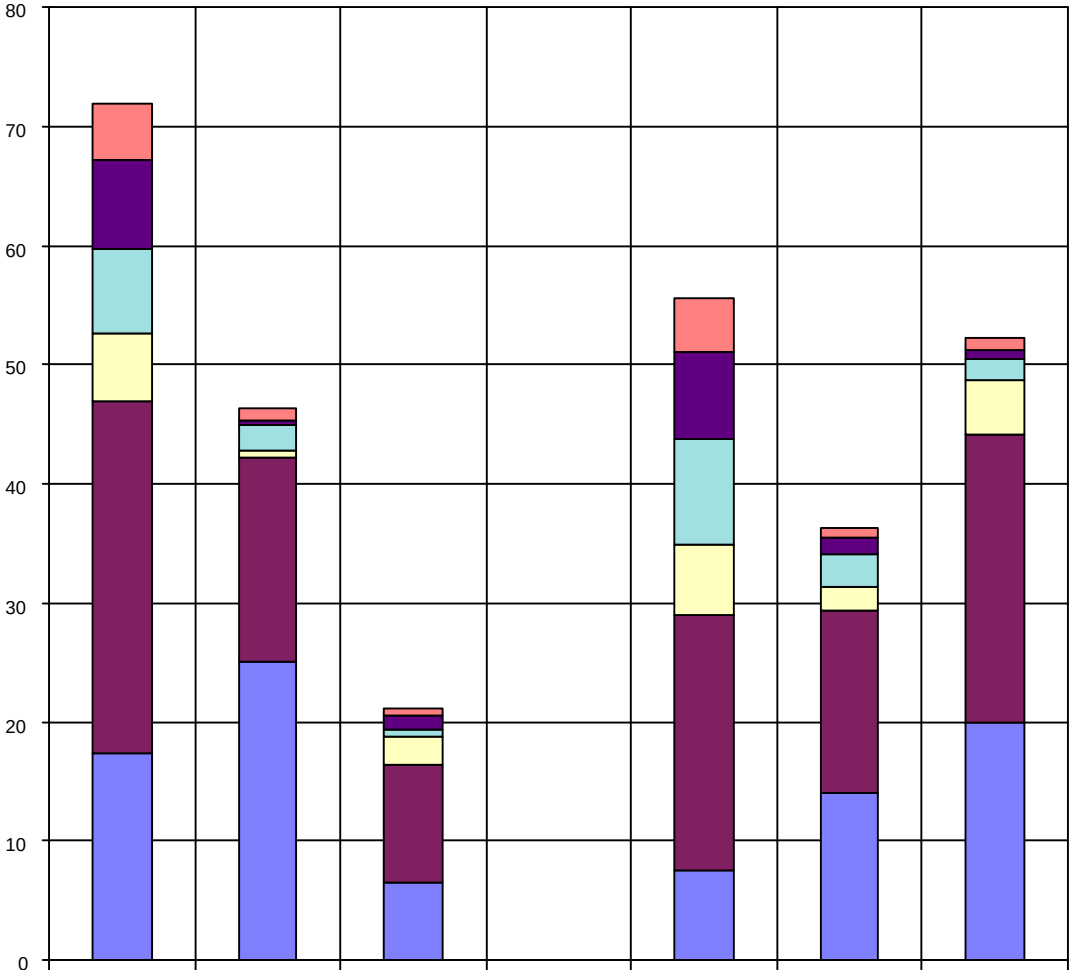
0 = less than $50 million or nil, and all data rounded to the nearest $100 million.
Source: Richard F. Grimmett, Conventional Arms Transfers to the Developing Nations, Congressional Research Service, various editions.

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Figure IV-9

Major Supplier Share of Total Gulf Arms Agreements and Deliveries: 1987-1998

($Current US Billions)



	Agreements: 87-90	Agreements: 91-94	Agreements: 95-98		Deliveries: 87-90	Deliveries: 91-94	Deliveris: 95-98
All Others	4.8	1	0.7		4.6	0.7	1
China	7.5	0.4	1		7.3	1.4	0.8
Russia	7	2.2	0.6		8.8	2.8	1.7
All Other Europe	5.8	0.7	2.4		6	1.9	4.5
Major West Europe	29.5	17	9.8		21.4	15.4	24.3
US	17.4	25.1	6.6		7.5	14	19.9

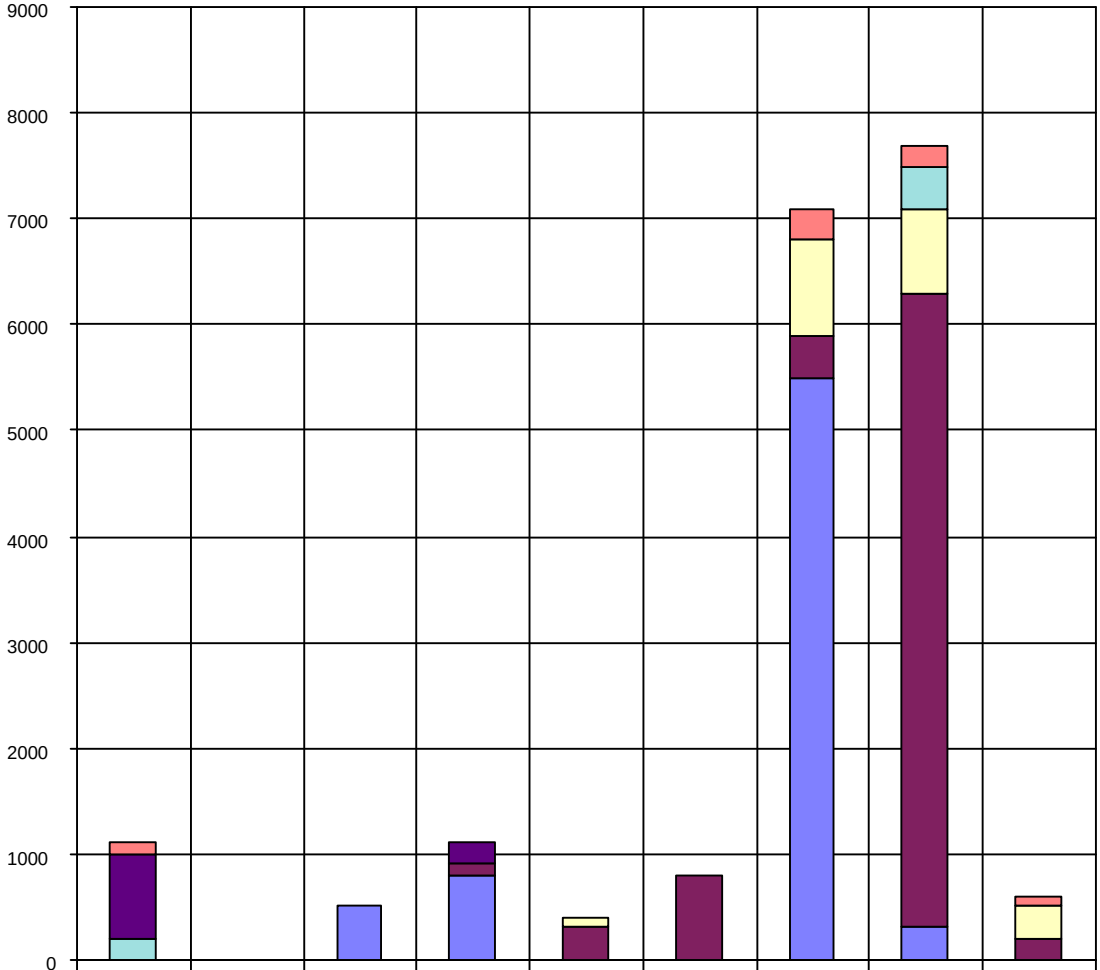
0 = less than $50 million or nil, and all data rounded to the nearest $100 million.
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Figure IV-9

Major Supplier Share of Total Gulf New Arms Agreements: 1996-1999

($Current US Billions)



	Iran	Iraq	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	Yemen
All Others	100						300	200	100
China	800			200					
Russia	200							400	
All Other Europe					100		900	800	300
Major West Europe				100	300	800	400	6,000	200
US	0		500	800			5,500	300	
TOTAL	1,100		500	1,100	400	800	7,100	7,700	600

0 = less than $50 million or nil, and all data rounded to the nearest $100 million.

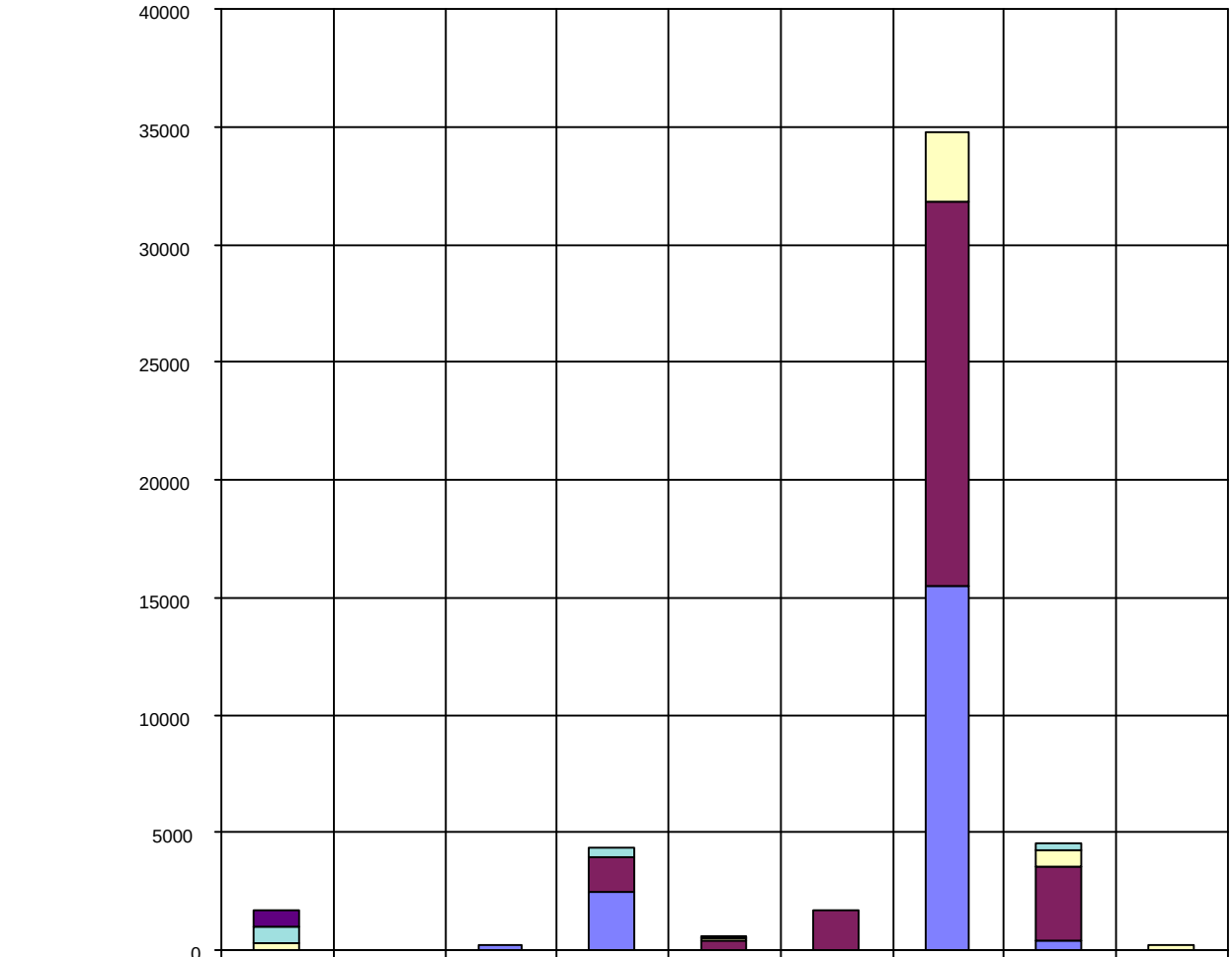
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Figure IV-10

Major Supplier Share of Total Gulf New Arms Deliveries: 1996-1999

($Current US Billions)



	Iran	Iraq	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	Yemen
All Others					100				
China	700								
Russia	700			400				300	
All Other Europe	300				100		3,000	700	200
Major West Europe				1,400	400	1,700	16,300	3,100	
US			200	2,500			15,500	400	
TOTAL	1,700		200	4,300	600	1,700	34,800	4,500	200

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Saudi Arabia

Saudi Arabia is the key to energy security in the Gulf, and to the success of US policy in the region. Saudi Arabia has long had close security ties to the U.S., and has been a reliable exporter of oil since the end of the oil embargo of 1974. It is the only Southern Gulf power strong enough to serve as a strategic counterbalance to Iran and Iraq, and is a critical partner in U.S. collective security efforts in the region. It is the world's largest "swing" producer, and plays a critical role in ensuring moderate and stable oil prices.

Saudi Arabia and Energy

Saudi Arabia has proven oil reserves of 263.5 billion barrels including the Neutral Zone it shares with Kuwait, or about 25.5% of the world's total. If the Neutral Zone is excluded, it has reserves of 261 billion barrels. It has gas reserves of 204.5 trillion cubic feet or about 4.0% of the world total.[70] Saudi Arabia is the world's largest oil exporter, and the growth in Saudi oil production will outstrip the growth in all of the nations in the Former Soviet Union, in spite of major increases in production by the former Soviet republics in the Caspian and Central Asia.

Saudi Arabia has a current total of 77 oil and gas fields, but more than half of its oil reserves are in eight fields, including Ghawar (the world's largest onshore oil field, with estimated remaining reserves of 70 billion barrels) and Safaniya (the world's largest offshore field, with estimated reserves of 19 billion barrels). Ghawar alone accounts for about half of Saudi Arabia's total oil production capacity. Saudi Arabia has fewer than 1,430 wells, which is extremely low relative to the volume of oil the country produces.[71]

Saudi Arabia produced about 8 million bbl/d of crude oil in early 2000 (28% of total OPEC crude production) and exports around 6.6-6.7 million bbl/d. It produced 8.4 million bbl/d in 1998 (and 8.6 million bbl/d in 1997, and it announced increases to levels of well over 8 million bbl/d in September 2000. Saudi Arabia maintains the highest share of OPEC oil export revenues (at around 28% of the OPEC total).[72]

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The U.S. Department of Energy estimates that Saudi Arabia will increase its production capacity from 8.6 million barrels per day in 1990, and 11.4 million barrels per day in 1998, to 13.6 (11.3-14.5) million barrels per day in 2005, 14.7 (12.5-17) million barrels per day in 2010, 17.7 (14.1-21.8) million barrels per day in 2015, and 22.1 (19.6-27.6) million barrels per day in 2020. [73]

This increase in Saudi production will be the most critical single factor in ensure that world oil exports expand to meet the needs of the global economy. The key question is whether it will take place. So far, many of the signs are positive. Although the EIA estimates that Saudi Arabia had roughly 3 MMBD of spare production capacity in 2000, Saudi Arabia continues to invest in the slow development of lighter crude reserves. Priority has been given to developing the Shaybah field in the remote Empty Quarter, which contains an estimated seven billion barrels of premium sweet crude oil, and ultimately is slated to produce 500,000 bbl/d of crude oil and 870 million cubic feet/day of natural gas. Shaybah began production in July 1998 and the Shaybah project is estimated to have a total cost $2-$2.5 billion. Developing it a will include three gas/oil separation plants (GOSPs) and a 395-mile pipeline to connect the field to Abqaiq, Saudi Arabia's closest gathering center, for blending with Arabian Extra Light crude. [74]

Saudi Arabia is the only Gulf nation, except Iraq, that has an extensive pipeline network that can bypass the Strait of Hormuz. Saudi Arabia's primary oil export terminals are located at Ras Tanura (5 million bbl/d capacity) and Juaymah (3 million bbl/d) on the Arabian Gulf, plus Yanbu (3 million bbl/d) on the Red Sea. Saudi Arabia also operates two major oil pipelines. One is a 4.8 million bbl/d East-West Crude Oil Pipeline (Petroline) that is used mainly to transport oil to refineries in the Western Province and to Red Sea terminals for direct export to Europe. The second is the 270,000 bbl/d Abqaiq-Yanbu natural gas liquids pipeline, which parallels the Petroline and serves Yanbu's petrochemical facilities.[75]. Saudi Arabia claimed in mid-2000 that it had substantial surplus oil export and pipelines capacity and that the East-West oil pipeline system could carry five million bbl/d but was being run at half capacity. It stated that its export terminals on the Arabian Gulf could load 14 MMBD were also being run at half capacity. [76]

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Like all Gulf state, Saudi Arabia faces sharply growing domestic demands for energy, Saudi Arabia is seeking increase gas use to ensure it can maximize its oil expots. Domestic gas demand is expected to grow as much as 8% per year through 2007, and increasing gas production is a key priority for the Saudi government. This domestic demand has already led to substantial investment in Saudi Arabia's Master Gas System (MGS), which started up in 1982. Gas development now consumes a large share of Aramco's budget and Aramco plans to invest $45 billion over 25 years on upstream gas development and processing facilities. The EIA reports that additional gas production is being encouraged as a feedstock for the country's growing petrochemical industry, as well as for electricity generation, desalination plants and other industrial establishments, and as a replacement for direct oil burning. Using gas for domestic energy frees up additional crude oil for export.[77]

Political, Economic, and Social Transition in Saudi Arabia

Saudi Arabia does not face any imminent risk of instability, but it will enter the twenty-first century in the midst of major political, social, economic, and military transitions. External transitions include

- The reemergence of Iraq as a major force in Gulf security and the world oil market,
- Iran’s uncertain shift towards political moderation and regional cooperation,
- The failure of the Southern Gulf states to develop their military forces effectively and develop meaningful collective security arrangements,
- Creeping proliferation, and
- The need to redefine dependence on the U.S. for security.

They also include the continuing uncertainties in the world energy market, a factor that drives virtually every aspect of the Saudi economy.

The most visible internal transition will be political: King Fahd’s health continues to deteriorate. For the first time in decades, Saudi Arabia is likely to have a king who is not one of the “Sudairi Seven.” Almost inevitably, this has raised a “succession issue” among policymakers

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and has focused the world's attention on (a) whether Crown Prince Abdullah will come to full power, (b) on how the Saudi regime will change, and (c) on whether there will be major changes in its foreign and domestic policy. In practice, however, this debate probably has little near to mid term importance. Crown Prince Abdullah will almost certainly become king, and Prince Sultan and other sons of King Saud will dominate the succession in the near to mid-term. The problem of succession seems unlikely to be a major priority for US policy until it falls to the next generation of princes at some point 5-10 years from now – if then.

It is the social, economic, and military transitions in Saudi Arabia that have priority, and it is important for American policymakers to keep them in perspective. In 1973, before the beginning of the oil boom, Saudi Arabia was a nation of roughly 6.8 million people. It had a GNP of less than $10 billion in market prices, and a per capita income of less than $2,500. It was largely rural or nomadic and largely pre-industrial in character. While no precise figures are available, its population growth rate was probably under 2.7% and less than 30% of its population was under 14 years of age.[78]

The oil boom that began in 1974 transformed Saudi Arabia. By 1997, it was a nation of 20.1 million people. Its economy had become so different that it is impossible to make direct comparisons of its GNP before and after the oil boom. The World Bank estimated that in 1997, Saudi Arabia's GNP was $143.4 billion, and that Saudi Arabia's per capita income was almost $7,000.[79] The CIA estimated in 1999 that its GDP was $186 billion and that its per capita income was $9,000.[80] The CIA estimates for 1996 were a GDP of $198 billion with a per capita GDP of $10,200, and the estimates for 1997 were a GDP of $206.5 billion with a per capita GDP of $10,300. In contrast, the EIU estimated a GDP of $135.5 billion for 1996, and $139.6 billion for 1997.

A poor and largely agricultural Saudi Arabia became a heavily urbanized, welfare state with a large service sector. Agriculture shrunk to only 9% of the GDP by 1995, while industry rose to 50% and services to 41%. The labor force shifted from a time when 64% of the total

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worked in agriculture to a force where only 5% works in agriculture while 40% works in government, 25% works in industry and oil, and 30% works in services. Equally important, a subsistence society has become a welfare society where close to 20% of all personal income comes from government grants, services, and subsidies.[81]

Much of this development has had positive effects. Oil wealth allowed Saudi Arabia to spend some $1,124 billion dollars on development between 1970 and 1995. Saudi Arabia had 8,000 kilometers of paved roads in 1970, and 67,893 in 1995. It had 27 wharves at its seaports in 1970 and 182 in 1995. It had 3,283 elementary schools in 1970 and 21,854 in 1995. It tripled the number of hospitals, set up 3,300 community health centers. It increased the number of doctors at its hospitals and clinics from 1,172 to 30,306, its nursing staff grew from 3,261 nurses to 60,736 nurses and added 33,047 technicians. It increased the output from its desalination plants from 5.1 million gallons to 512 million gallons, and its electric generation capacity from 344 megawatts to more than 17,400 megawatts. Saudi Arabia had 119 factories in 1970 and 2,303 in 1995, with an invested capital of $40.7 billion.[82]

Internal Change and Saudi Security

At the same time, Saudi Arabia faces many challenges. Its military forces are not strong enough to defend the Kingdom from Iran or Iraq without U.S. military aid, and it is dependent on a strategic partnership with the U.S. and other Western states. It has not been able to catalyze effective collective security efforts within the Gulf Cooperation Council (GCC) and it still faces serious problems in eliminating its historical rivalries with other Southern Gulf states.

Most importantly, Saudi Arabia must deal with the social and economic impacts of explosive population growth described earlier at a time when its oil wealth has diminished sharply in both absolute and relative terms. These problems did not begin with the “oil crash” in 1997. The same wealth that transformed other aspects of Saudi society helped raise the average population growth rate to 4.7% during 1980-1995.[83]

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Although this growth rate declined to an average of 3.3% during 1990-1995, it had risen back to 3.45% in 1995 and grew again in 1996 to 3.6%. While it dropped to 3.42% in 1997, this was still higher than in 1990-1995, and one of the highest rates of growth in the world. The end result is that 43% of the population was under 14 years of age by 1999. The World Bank forecasts that Saudi Arabia's population will grow by about 3.3% per year over the next five years. As a result, even conservative World Bank estimates project a total Saudi population approaching 33.7 million people in 2010.[84]

Oil wealth also led to radical changes in Saudi Arabia's social structure. Urbanization reached 67% of the total population by 1980 and 79% by 1995 -- a total of roughly 14.9 million people. By 1995, over 20% of Saudi Arabia's population lived in cities of over one million -- a total of roughly 14.9 million people. Education changed radically: Only 61% of school age Saudi males ever entered primary school when the oil boom began while the percentage rose to over 80% by 1990. The percentage for females rose from 29% to 73%. Literacy in the population as a whole rose from fewer than 15% of the population to over 60%, and Saudi society became exposed to the world's media. Saudi Arabia had over 250 television sets per 1,000 people in 1997, and over 95% of the Saudi people had exposure to radio.[85] This helps explain why Saudi demand for utilities like electric power is growing by around 5% annually, and the government estimates $117 billion will need to be invested in electricity supply alone over the next 24 years.[86]

Structural Economic Problems

Since the early 1980s, Saudi Arabia's oil wealth has declined in both absolute and per capita terms. Saudi Arabia's population has grown explosively while oil revenues have remained nearly constant. The World Bank estimates that Saudi Arabia's population rose from roughly 9 million in 1980, to 21 million in 1998 -- a rise of 233%. In contrast, the World Bank estimates that Saudi Arabia's GDP dropped from $156.5 billion in 1980, in current dollars, to $128.9 billion in 1998. This is a drop of nearly 20% in current dollars and well over 30% in constant dollars. U.S. estimates are similar. They indicate that the Saudi GNP dropped by over 35% during the same period.[87]

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Saudi Arabia failed to adequately diversify its economy as its oil revenues declined. The earnings from its petroleum products and downstream operations were partly offset by their cost and by the diversion of crude oil to feedstock. Domestic energy use has remained extremely wasteful, and much of Saudi Arabia's GDP now consists of service industries whose net impact is to increase and meet the demand for imports. Trade makes up nearly 50% of the Saudi GDP today, but only a few percent of Saudi exports are manufactured. Trade is virtually all in petroleum-related exports and in imports financed by these exports. [88] While estimates differ, virtually all outside analyses agree that Saudi Arabia's per capita income declined to less than 40% of its peak at the height of the oil boom.

An analysis by the EIA, published in April 2000, found the sharp decline in oil revenues which Saudi Arabia experienced during 1998, and early 1999, represented a major challenge for the country's government (since oil export revenues account for nearly 90% of total Saudi export earnings). From January 1998 through March 1999, the price of Saudi oil averaged between $9 and $13 per barrel, down sharply from late 1997, and the lowest in inflation-adjusted terms for any sustained period of time since 1973.[89]

Low oil prices, in late 1997 thru early 1999 forced state oil and gas company Saudi Aramco -- whose expenditures account for around 6% of Saudi GDP) -- to reassess its capital expenditure program, to delay a series of upstream and refining projects (at an estimated savings of $2 billion this in 1998), and to defer bidding on the $150-$200 million Haradh (phase 2) crude oil production increment project. In October 1998, a planned $800 million upgrade of the Rabigh oil refinery was cancelled, leaving Saudi Arabia with only one major energy project under bidding—the $2 billion Hawiya natural gas processing plant (part of an ambitious expansion plan for the Saudi Master Gas System).

This situation eased in 1999-2000. Saudi oil prices increased sharply following OPEC's March 23, 1999 cutback agreement, however, and average $25-$30 per barrel during the first six months of 2000. The sharp increase in oil prices over the past year has significantly improved

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Saudi Arabia's economic situation, with 5.4% real GDP growth forecast for 2000. The EIA forecast that Saudi Arabia would earn about $60 billion in 2000 from crude oil exports, up 55% from around $38 billion in 1999, and double 1998 oil export revenues. Other forecasts, later in 2000, indicated that Saudi Arabia might earn as much as $80 billion.[90]

The dramatic turnaround in Saudi oil revenues resulted in a significant higher GDP growth rate, greatly improved external trade and internal budgetary situations, and new investment in energy projects. Nevertheless, they ease Saudi Arabia's problems rather than solve them. This explains why Crown Prince Abdullah has continued his efforts to reform the Saudi economy, reduce dependence on foreign labor, encourage private domestic and foreign investment, and open up the nation's economy to the WTO to help make it globally competitive. If fully implemented, the new Saudi five year plan issued in 2000 will carry forward many of the reforms the Kingdom needs, although it would not free it of the need for major additional investments in its energy sector.

Saudi Arabia remains far too heavily dependent on oil revenues (for around 90% of total export earnings, about 70% of state revenues, and 40% of GDP) despite its attempts to diversify its economy. Unless very high oil prices become a continuing fact of life, it will still face budget and investment problems and be unable to fund both its entitlements and development. Most important, it will face serious problems because of its demographics.

Saudi Demographics

Demographics are the key problem. The World Bank estimates that Saudi Arabia's per capita income increased by an annual average of only 0.5% during 1970-1998, and decreased by a total of nearly 20% during 1985-1995. During the same period, however, total Saudi Arabian private consumption rose from 1980-1998 from $34.5 billion to $53.2 billion. This growth in consumption reflected both the impact of population growth and a growing social dependence on imports and services. Private consumption rose from 22% of the GDP in 1980 to 41% in 1998, while government consumption rose from 16% to 27%. At the same time, gross domestic

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investment dropped slightly from 22% to 21% and gross domestic savings dropped precipitously from 62% of GDP to 26%.[91]

Most of Saudi Arabia's young population is not educated for real-world jobs or to compete in the modern world economy and nearly half of its labor force is foreign. While over 90% of Saudi young males and females reached grade four in 1995, only 5% of males and 2% of females moved on to secondary school. Much of Saudi education is "Islamic," and oriented towards recitation and rote learning, rather than towards training students for real world jobs and to be competitive with the leading economies of the developing world.

Saudi Arabia educates women with no clear idea of the role they should play in the labor force. Although female workers rose from 5% of the total labor force in 1970 to over 13% in 1997, they have been heavily restricted towards teaching other women.[92] Dependence on welfare, meaningless government and government-related jobs, and foreign labor has left much of native Saudi youth without a work ethic, while declining per capita oil revenues mean the Kingdom cannot hope to sustain its past pattern of disguised unemployment and subsidies.

Recent increases in educational spending will do little to improve the character and quality of Saudi education. Far too much of this education is unfocused, religious in character, reliant on route learning, and provided by low-wage contract teachers from outside Saudi Arabia. Saudi youth had a direct and undisguised unemployment rate of 30-36% in early 2000. Some 800,000 young Saudis a year now enter the labor force and have uncertain prospects of finding real, productive employment unless Saudi Arabia radically restructures its educational system and economy. Its government has swollen to the point where it consumes 40% of Saudi Arabia's labor force, and more than half of its native labor force. The Saudi government costs the country's economy over $50 billion a year. Government spending accounts for 36% of GDP, and is in its eighteenth year of continuous budget deficits, although higher than expected oil revenues may balance the Saudi budget by the end of the year 2000.

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Transformation is the Price of Stability

If Saudi Arabia pushes ahead with its current reform plans, it may well be able to meet these internal challenges, but it will not be easy. During the coming decades, Saudi Arabia must make massive new investments to maintain its status as a petroleum power, and make equally massive investments in the national infrastructure necessary to support its rapidly growing population. These investments will cost in excess of one-third of a trillion dollars, is a far larger sum than Saudi Arabia can self-finance, even if it were to shift from almost complete dependence on state investment to dependence on private financing.[93]

Saudi Arabia must restructure its economy and diversify to find declining per capita oil wealth and come to rely on native, rather than foreign labor. It must transform its society to compete in a world where oil wealth alone is not enough to keep its per capita income from dropping steadily lower, and do so without losing its Islamic and Arab character.

There has already been progress, and Crown Prince Abdullah seems committed to pushing ahead with reform. Saudi Arabia's government has accepted the need to reduce state involvement and increase private sector investment in its last two five year plans, although it so far has moved slowly. It has gradually cut some subsidies, and increased the price of gasoline by 50% in May 1999, although only to 90 cents per gallon. Crown Prince Abdullah created a new Supreme Economic Council in September 1999, and gave it the mandate to increase investment, give employment to for Saudi nationals, and promote the private sector. Saudi Arabia is also seeking admission to the WTO, in part to force its economy to become more efficient and create better conditions for foreign and private domestic investment.[94]

Saudi Arabia has become more aggressive in "Saudisation," and its efforts to increase the employment of Saudi citizens by replacing 60% of the estimated 5-6 million foreign workers in the country. It has stopped issuing work visas for certain jobs, has moved to increase training for Saudi nationals, and has set minimum requirements for the hiring of Saudi nationals by private companies. At present, the private sector accounts for around 40% of Saudi Arabia's GDP (and

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89% of employment), but only 5%-10% of those employed in the private sector are Saudi nationals.

Saudi Arabia also has encouraged foreign investment in its energy sector, although it has not indicated it will accept investment in downstream oil production. Crown Prince Abdullah and Oil Minister Ali Naimi met with U.S. oil companies (in September 1998) regarding possible upstream investment in Saudi Arabia's oil, natural gas industries, and petrochemicals. Saudi Arabia asked foreign companies to submit proposals for possible projects for the first time since it nationalized these industries in the mid-1970s. Saudi officials have made it clear, however, that they feel that more foreign involvement in upstream oil production is not necessary at his point.[95]

Continuing External Threats: Saudi Arabia, Iran, Iraq, and Yemen

Saudi Arabia is free to concentrate on internal security as long as the US maintains a strong military presence in the Gulf area, and Saudi Arabia and the US work closely together to deter regional threats. Saudi Arabia does, however, face continuing external threats from Iran and Iraq, and a possible threat from Yemen.

Saudi Arabia and Iran

Saudi relations with Iran have improved steadily since the election of President Khatami in 1997, but tensions still exist along sectarian lines and the two states are still rivals for power and influence in the Gulf. Iran’s efforts to proliferate present a new potential threat to Saudi Arabia, and challenge existing US and Saudi military capabilities with a new form of asymmetric warfare. There are natural differences in the energy strategies of the two countries. Saudi Arabia is a low cost producer with immense reserves that can afford to produce at very high levels even when oil prices are low. Iran has much higher production and development costs, more limited production capacity and reserves, and much less capability to pursue a “market share” strategy. Put differently, Iran benefits from limits on Saudi production.

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Saudi Arabia is responding by continuing to strengthen its military forces, and maintain close ties to the US, but it has also chosen a close dialogue with Iran and the regime of President Khatami over attempts to isolate Iran or sanction it. Prince Abdullah has been a key leader in this effort, and Oman began to pursue a similar approach to Iran even earlier. So far, this mix of defense and dialogue has worked well. Iran has sharply reduced its support of extremists and terrorists, has ceased public attacks on the Saudi regime and adopted a friendly diplomatic attitude, and has worked with Saudi Arabia to reach viable compromises on energy policy and OPEC quotas. The end result has been notably more successful than US efforts to sanction Iran. In fact, the Saudi initiative has aided US security interests in two important ways. First, reducing tensions in the Gulf enhances US security interests. Second the Saudi-Iranian dialogue sets a useful precedent for a possible US-Iranian re-engagement -- assuming the political situation in Iran continues develop in ways that will allow for an official US-Iranian dialogue to occur.

The fact remains, however, that Saudi Arabia still confronts an Iran that continues to proliferate, that has developed a considerable capability to use asymmetric warfare to attack Gulf shipping and targets in the Gulf, and trains Islamic and other extremists. Iran's ties to Saudi Shi'ites, ability to attack Saudi religious legitimacy and disrupt the pilgrimage, provide continuing options for Iranian pressure on the Kingdom. Iran also remains overtly hostile to the Arab-Israel peace process and any Arab support of this process, to the US presence in the Gulf, and to military ties between Gulf powers and the US. There is also no assurance as yet that the struggle between Iran's "moderates" and "hardliners" will be resolved in ways that ensure Iran remains relatively friendly to Saudi Arabia.

Saudi Arabia and Iraq

Iraq is a very different case from Iran from a Saudi perspective. Iraq remains a hostile dictatorship that has repeatedly threatened Saudi Arabia and Kuwait since the Gulf War. Saddam Hussein has continued to attack the Saudi regime and its legitimacy. He also regularly threatens Saudi Arabia for allowing the US and Britain to use its territory to enforce the Southern no fly

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zone in Iraq. Iraq sent aircraft across its border with Saudi Arabia in September 2000, and an effective Saudi-Iraq dialogue with Saddam Hussein seems virtually impossible.

Oil policy remains an issue even if prices are high. Iraq too has major oil reserves, but nearly two decades of war and a decade of sanctions have limited Iraq's ability to develop its oil wealth and it needs major investment to rework and modernize its existing fields. It may be years before Iraq can exploit its new fields and costs are difficult to estimate. In the short to medium term, Iraq benefits from any limits it can impose on Saudi oil production and needs to take every possible step to maximize its oil revenues.

Like Iran, Iraq is a major proliferator. It is likely to rebuild its massive military forces the moment UN sanctions are lifted or can be ignored, and it is already a major conventional power. Unlike Iran, it shares a common and poorly defended border with Saudi Arabia, and could deploy corps size forces for an attack across the border in a matter of days.

Saudi Arabia and Yemen

Yemen does not pose an overt military threat to Saudi Arabia. In fact, Saudi Arabia has greatly improved its relations with Saudi Arabia in recent years and signed a common land and marine border agreement with Yemen on July 4, 2000. Even in the past, clashes in the border area were relatively limited and often involved smuggling and tribal issues, rather than serious differences at the state to state level. Yemen also has had few recent imports and has seen its military forces devastated by civil war, while its government has become more moderate and more focused on economic development.

Nevertheless, Saudi Arabia sees Yemen as an enduring potential threat because of its large population and armed forces, past claims on Saudi territory, and a level of poverty that could drive it to attack a far richer Saudi Arabia. Yemen has a population of 18 million, virtually the same as that of a far larger Saudi Arabia. It has armed forces with 66,300 men, 1,320 main battle tanks, and 49 combat aircraft. While these forces are smaller and far less well-equipped than those of Saudi Arabia, they can still pose a problem on the border using low intensity conflict, and

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Yemen's strategic geography places it at the Bab el Mandab. It also faces serious internal pressures. Its population growth rate is nearly 4%, its per capita income is less than $2,300, and it has structural real and disguised unemployment of over 30%.[96]

Saudi Military Capabilities

Saudi Arabia has spent some $18 to $22 billion annually on defense in recent years. It signed a total of $21.9 billion in new arms agreements between 1991 and 1999. Some $20.4 billion came from the US, $8.2 billion from Europe, and $300 million from other countries. It had placed massive orders before and during the Gulf War, and took delivery on $76.1 billion during the same period, $27.8 billion came from the US, $38.0 billion from Europe, $200 million from China, and $200 million from other countries.[97]

It has created regular forces with a total of some 126,000 men, with an additional 75,000 actives in its National Guard. Its army has some 75,000 actives, and has nine active brigades – three armored, five mechanized, and one airborne. It is deploying 315 M-1A2 Abrams tanks, and has 450 M-60A3s. It also has 290 obsolete AMX-30s, many of which are in storage. It has large numbers of modern armored personnel carriers (APCs) and armored infantry fighting vehicles, including 400 M-2 Bradleys and 1,750 M-113s. It has nearly 200 active 155mm self-propelled artillery weapons, including 110 US-made M-109 A1Bs and 90 GCTs, and large numbers of towed artillery weapons and mortars. It also has 60 ASTROS II multiple rocket launchers. It has modern antitank weapons and adequate light antiaircraft systems. It is well equipped with helicopters, including 12 AH-64 attack helicopters, and has good logistic equipment. The National Guard is largely equipped with wheeled armored infantry fighting vehicles, but can provide rear area security, scouting, and reconnaissance capability.[98]

The main problems with Saudi land forces are a lack of training and a force structure organized more to fight from military cities than conduct rapid deployments and execute sustained maneuver warfare. Training above the battalion level is weak, particularly in combined arms and joint operations. Logistic equipment and stocks are good, but the organization and training are

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weak. The regular army lacks manpower and leadership, although the Guard is an effective force. The so-called GCC rapid deployment force is a hollow exercise in military symbolism, and Saudi land forces lack any meaningful prospect of major reinforcement from the other Southern Gulf states that will help in an intensive war against Iraq. Saudi-Kuwaiti planning and cooperation is grossly inadequate above the battalion level.

The Saudi Air Force and Air Defense Force have a total of 20,000 men, some 417 combat aircraft, and 33 surface-to-air missile batteries, including 16/128 I Hawk batteries. Saudi Arabia's first line air strength includes 70 F-15Cs, 25 F-15Ds, 72 F-15Ss. 76 Tornado IDSs, and 24 Tornado ADVs. It also has 77 aging F-5E/Fs and 10 RF-5s. Saudi Arabia has 5 E-3A airborne warning and air control system (AWACS) aircraft, and 16 tankers. Saudi Arabia is the largest modern air force in the Gulf, and the only one with an airborne warning and air control system, major in-air refueling capability, and a modern land-based air defense sensor and control network. It has a high degree of interoperability with US forces, and good average training levels. Readiness and aircrew numbers are inadequate, however, and it has only limited capability for joint warfare and proficiency in offensive operations. It cannot manage a large defensive air battle without US aid, and most potential Southern Gulf air reinforcements do not have the readiness and proficiency to be integrated into a major air battle against Iraq.

The Saudi Navy has some 15,500 men and has modern bases in both the Gulf and the Red Sea. It has a total of four frigates and four corvettes, and the frigates are modern French Madina-class missile ships. It has nine missile craft, and seven mine countermeasure ships, three of which are modern Sandown-class vessels. It has 31 armed helicopters, and 3,000 marines. Unfortunately, it is better equipped than trained, and is only beginning to develop an effective capability for surface warfare. Its mine warfare forces are improving, but its capabilities in surface-to-surface missile warfare are limited. Furthermore, the capabilities of most other Southern Gulf navies are equally limited. It can, however, perform a maritime surveillance and escort mission and supplement US and British naval action.

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Collective Security in the Southern Gulf

While Saudi Arabia may receive only limited warfighting support from its Gulf allies, it scarcely stands alone and clearly recognizes this fact. It has long been the most important US military ally in the Gulf region. While Saudi Arabia has often strongly support the Arab side in the Arab-Israeli conflict, and has limited the US presence in Saudi Arabia, even a summary history of US and Saudi military cooperation shows the depth of US and Saudi cooperation:[99]

- Although the US does not have a formal status of forces agreement with Saudi Arabia, it has long had close military ties to Saudi Arabia. The US first leased port and air base facilities in Dhahran, Saudi Arabia, in 1943. It renewed these leases on April 22, 1957 and maintained them until April 2, 1962 -- when they were canceled both for political reasons and because the US Strategic Air Command ceased to forward deploy the B-47. Saudi Arabia renewed its US Military Training Mission Agreement with the US in June, 1992.[100]

- During the late 1970s and 1980s, Saudi Arabia increased the size of its air bases and port facilities to aid in US power projection to Saudi Arabia, and created massive stockpiles of munitions and equipment, and support facilities, that could be used by US forces deploying to Saudi Arabia. Saudi Arabia purchased $16 billion worth of US military construction services during this period, and supervised military construction worth billions of dollars more.[101]

- The US and Saudi Arabia cooperated closely in setting up combined air and naval defenses against Iran beginning in 1983, when Iraq came under serious military pressure from Iran. The two countries conducted combined exercises, and cooperated in establishing the "Fahd Line," which created an Air Defense Identification Zone and forward air defense system off the Saudi coast. This cooperation helped Saudi Arabia defend its air space and shoot down an Iranian F-4 that tested Saudi defenses on June 5, 1984. The US and Saudi Arabia have jointly operated E-3A AWACS units in Saudi Arabia ever since. The US and Saudi Arabia also cooperated closely during the tanker war of 1987-1988.

- The US deployed massive land and air units to Saudi Arabia during the Gulf War, and jointly commanded UN Coalition forces with Saudi Arabia during Desert Storm. Saudi forces played a major role in the air and land campaigns. Saudi Arabia also provided the US with $12.809 billion in direct aid during the Gulf War, and $4.045 billion in goods and services, for a total of $16.854 billion. [102]

- Saudi Arabia commanded both Arab task forces -- Joint Forces Command (East) and Joint Forces Command (North).[103] Saudi forces were organized under the command of Lt. General Prince Khalid Bin Sultan al-Saud. The Arab task forces reported to Prince Khalid through a Joint Forces Command in the Saudi Ministry of Defense, and were divided into a Joint Forces Command (North), a Joint Forces Command (East), and a Joint Forward Forces Command Ar'Ar (the command of the Arab defensive forces screening the border area). The Ar'Ar command was subordinated to the Joint Forces Command (North). It included two Saudi National Guard battalions, a Saudi Army airborne battalion, and a Pakistani armored brigade with about 5,500 men, over 100 tanks, and about 90 other additional armored vehicles and artillery weapons. These forces did not play an offensive role in Desert Storm.[104] By the time the AirLand phase of the war began, the Saudi ground forces in the theater totaled nearly 50,000 men,

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with about 270 main battle tanks, 930 other armored fighting vehicles, 115 artillery weapons, and over 400 anti-tank weapons.[105]

- The Saudi Air Force flew a total of 6,852 sorties between January 17, 1991 and February 28 -- ranking second after the US in total air activity during the Gulf War, and flying about 6% of all sorties flown. These sorties included 1,133 interdiction missions, and 523 battlefield air interdiction missions, for a total of 1,656 offensive missions. The RSAF flew 2,050 defensive counter-air missions, 129 offensive counter-air missions, and 102 escort missions for a total of 2,281 air defense sorties. The RSAF flew 118 reconnaissance sorties, 85 E3-A AWACS sorties, 485 refueling sorties, and 1,829 airlift sorties.[106] During the slightly longer period of January 16 to February 28, Saudi Air Force F-15C units flew 2,088 sorties (over one-third the total F-15C sorties flown by the USAF) and 451 Tornado ADV sorties. Saudi pilots were as capable in these air defense sorties as most pilots in NATO. The RSAF also flew 665 Tornado GR1/IDS strike sorties, 1,129 F-5 sorties, and 118 RF-5 sorties. Saudi F-15Cs shot down three Iraqi Mirage F-1s with air-to-air missiles -- including the only double kill by a single fighter in the war on January 24, 1991. The RSAF lost only two aircraft -- one Tornado GR1 to anti-aircraft fire and one F-5 to unknown causes.[107]

- Since the Gulf War, the US has expanded its security arrangements with Saudi Arabia. Although no formal status of forces agreements exist, the US and Saudi Arabia have expanded the USMTM agreement to increase US access to Saudi air and seaports, including Jubail, and have improved the capabilities of the combined AWACS force. The US deploys a wing of aircraft in southern Saudi Arabia, including F-117 and U-2 aircraft. Saudi Arabia has increased stocks of selected spares and electronics to support US forces in deploying -- including enough parts and supplies to support 15 USAF tactical fighter equivalents -- and has increased the number of combined exercises with US forces.[108] It is standardizing key aspects of its C^4I system to make them interoperable with US C^4I systems, including theater missile defense arrangements for Saudi Arabia's Patriot missiles.[109]

- Since the Gulf War, Saudi Arabia has made major purchases of US M-1 tanks, M-2/M-3 armored vehicles, and US artillery and related support systems that increase both Saudi interoperability with US forces and Saudi capability to support the rapid deployment of heavy US ground forces to Saudi Arabia. Although Saudi Arabia has not agreed to formal prepositioning of US Army combat unit equipment in Saudi Arabia, it has carried out combined exercises with US land forces since 1991, and is considering storage of selected US Army heavy combat equipment. The US maintains a US Military Training Mission in Saudi Arabia with 69 military four civilians, and nine local personnel.

- The Saudi National Guard has long relied largely on US equipment, and on training support by the US Vinnell Corporation.

Saudi Arabia now has many of the elements of a modern force structure.

US advisors now work closely with Saudi military forces, and US and Saudi forces have improving interoperability and experience in joint exercises. Saudi Arabia has large amounts of modern US military equipment. During 1992-1999, Saudi Arabia signed $20.4 billion worth of new US arms agreements out of a total of $28.9 billion from all sources, and took delivery on $27.7 billion out of a total of $66.1 billion.[110] Saudi Arabia has provided critical basing and other

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support to US in operations against Iraq in the Southern No Fly Zone, in building up forces to deter Saddam Hussein's adventures since the Gulf War, and during Operation Desert Fox in December 1998.

U.S. military ties to Saudi Arabia do, however, present continuing problems. There are inevitable differences in national interest and culture. These differences have aroused the opposition of some of Saudi Arabia's hard-line Islamists, as well as most opponents of the regime, including some violent terrorists movements, The attacks on the Saudi National Guard training center in November 1995, the US Air Force barracks at Al Khobar in June 1996, and USS Cole in Aden harbor in October 2000, are a warning of how serious these tensions can be.

Saudi Arabia's partnership with the U.S. also presents problems in burden-sharing, counter-terrorism, prepositioning, and longer-term problems in defining a stable and equitable division of effort. There is also substantial opposition at virtually every level within Saudi Arabia, including some ministers and members of the Royal Family, to what is often perceived as wasteful and corrupt expenditures on military forces and arms imports – some of which is inevitably directed at the US.

Implications for US Policy

There are no easy answers to shaping US policy towards Saudi Arabia, or towards any other Southern Gulf state. The US and Saudi Arabia have found over the years that continuing dialogue is necessary and that there still are many unanticipated policies and real differences. In fact, it is important to note that current US policy towards Saudi Arabia is the product of decades of evolution and is successful in most ways. Many of the supposed weaknesses in US policy are the result of compromises on both sides that have to be made in the real world and that can never be made perfectly or with a clear vision of the future.

There are, however, where the US does need to make improvements:

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- *The US needs to actively support Saudi Arabia's efforts at economic reform, encourage Saudi Arabia to persist in these plans, and to do everything it can to encourage US industry to help when Saudi Arabia offers competitive opportunities.* Saudi Arabia is scarcely "oil poor" today, but it can become "oil poor" in the future. It does not need to follow IMF and World Bank models of development, but it does need to be more aggressively in pursing its own reform plans. Helping Saudi Arabia achieve these goals should change from a relatively moderate US priority to a key policy objective. It is the key to ensuring Saudi internal security and a sound basis for US and Saudi cooperation, and Saudi Arabia is the strategic key to the success of US policy in the Gulf.

- *The US needs to fully recognize the Kingdom's economic priorities in seeking burden sharing and proposing arms sales.*

- *The US needs to recognize that Saudi Arabia is the key to the success of a more active US energy policy in the Gulf region.* It is key to the success to any dialogue on price stabilization, and on ensuring the successful expansion of Saudi exports. The secure and continuing flow of the investment Saudi Arabia will require will be critical to ensuring suitable energy supplies. The key will be to forge a partnership that relies on markets forces whenever possible, and which is of convincing mutual self-interest to both sides.

- *A gentle dialogue is needed on Saudi Arabia's requirement for population management policy, and to push Saudi Arabia towards fully implementing its own Saudisation policies and developing competitive educational programs that train its youth for real-world jobs.*

- *There are serious weaknesses in Saudi military capabilities that need attention.* The Saudi Air Force has seen a serious decline in readiness in recent years, it has failed to develop effective offensive capabilities, and the Saudi Army is not effectively organized and trained to defend the Saudi border and Kuwait against Iraq. These are key contingency capabilities the US needs to help Saudi Arabia develop and they are far more important than vague concepts of strengthening the GCC or improving force-wide capability without prioritization by mission.

- *USCENTCOM has already created an engagement strategy with Saudi Arabia that stresses training and maintenance, and a focus on making Saudi Arabia's existing weapons and forces effective, rather than showpiece arms buys.* The US should firmly support Saudi military modernization, interoperability with US forces, and creating effective Saudi capabilities for regional defense. It should not make arms sales a goal in itself, and it should expand the USCENTCOM engagement strategy to explain how the US effort to help Saudi Arabia to improve its military capabilities is in the interest

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of the Saudi people and is cost-effective for the Kingdom. The US needs to worry more about explaining the "legitimacy" of its security effort in the region.[111]

- *The US cannot move entirely over-the-horizon or out of sight, and USCENTCOM has probably already reduced the US presence in Saudi Arabia to levels close to the minimum that meets Saudi and regional security needs.* The US must, however, remain acutely conscious of Saudi Arabian religious and cultural sensitivities.

Kuwait

Kuwait is the center of day-to-day US security concerns in the Gulf. It is of major strategic importance as an oil power, and Iraq's effort to annex it by invading and seizing Kuwait was the reason for the Gulf War. While it is difficult to prioritize US strategic involvement in the Southern Gulf, Kuwait probably ranks second after Saudi Arabia in terms of overall importance. The defense of Kuwait against another Iraqi invasion is also the most important current contingency for sizing US rapid deployment capabilities in the Gulf region.

Kuwait and Energy

Kuwait a plays a critical role in any projection of the world's future oil supplies. Kuwaiti net crude oil exports are expected to average around 1.8 million bbl/d in 2000, up slightly from 1.7 million bbl/d in 1999 Kuwait has oil reserves of 112.5 billion barrels, or about 10.9% of the world's total, and gas reserves of 52.7 trillion cubic feet or about 1.0% of the world total.[112] The Neutral Zone area, which Kuwait shares with Saudi Arabia, holds an additional 5 billion barrels of reserves, half of which belong to Kuwait. Most of Kuwait's oil reserves are located in the 70-billion barrel Greater Burgan area, which is widely considered the world's second largest oil field, surpassed only by Saudi Arabia's Ghawar field. Kuwait's Raudhatain, Sabriya, and Minagish fields have large proven reserves as well, with 6 billion, 3.8 billion, and 2 billion barrels of oil, respectively. All of these fields have been producing since the 1950s.[113]

The U.S. Department of Energy estimates that Kuwait will increase its production capacity from 1.7 million barrels per day in 1990, and 2.6 million barrels per day in 1998, to 3.1 (2.9-3.2) million barrels per day in 2005, 3.8 (3.5-4.0) million barrels per day in 2010, 3.8 (3.9-

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4.9) million barrels per day in 2015, and 5.2 (4.3-5.6) million barrels per day in 2020.[114] These production figures could be even higher if Kuwait could fully exploit its offshore oil reserves, and oil fields near its border with Iraq.[115]

Kuwait's near term objectives are to increase its production capacity from a current 2.4 million bbl/d to 3.5 million bbl/d by 2005. To facilitate this increase in capacity, Kuwait is considering permitting foreign oil companies to invest in upstream production, which would reverse more than two decades of Kuwaiti policy. Kuwait announced in July 2000 that it intended to launch an international tender for infrastructure improvements which would allow it to increase its export capacity to 3 million bbl/d. Plans include the construction of two additional mooring buoys at Mina al-Ahmadi, additional storage capacity, and additional pumping stations. Kuwait has completed major renovations of Mina al-Ahmadi, the country's main port for the export of crude oil, to both repair damage during the Gulf War and improve the facility, Kuwait has also repaired its terminals at Mina Abdullah, Shuaiba and Mina Saud.[116]

Kuwait is seeking to reduce its barriers to foreign investment. The current policy, which has been in place since 1975, limits the participation of foreign oil companies to providing technical assistance and construction and maintenance services under contracts, which pay them fixed prices for specific activities. Kuwait's constitution forbids the award of concessions that give foreign entities an ownership interest in Kuwait's natural resources. Nevertheless, the government has sought to find a way to involve foreign oil companies in increasing production without violating the constitution. The Supreme Petroleum Council (SPC) approved foreign cooperation in principle in 1997, but opening upstream activities to involvement by foreign oil companies proved controversial with opposition members of the Kuwaiti parliament.

The structure of the agreements the Kuwaiti government is proposing are called "Operating Service Agreements," unlike PSA's, allows the Kuwaiti government to retain full ownership of the oil reserves. The foreign firms would be paid a "per barrel" fee, along with allowances for capital recovery and incentive fees for increasing reserves. Kuwait held a formal

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conference in November 1999 to discuss the upstream opening, but the initiative was stalled by strong political opposition. In February 2000, the Kuwaiti parliament passed a resolution calling on the government not to proceed with the program until legal issues involving foreign interests in the Kuwaiti oil sector were resolved. New legislation dealing with the foreign investment program is currently under consideration in the Kuwaiti parliament.

Kuwait's refining capacity was damaged severely during Iraqi invasion and occupation in 1990-91, but a Kuwaiti $400-million downstream reconstruction program was completed in mid-1994. Kuwaiti officials have expressed interest in accelerating development of the country's relatively small petrochemical industry to boost the value of Kuwait's crude oil reserves; helping to protect Kuwait's revenues during periods of low crude prices; and boost Kuwaiti revenues while adhering to OPEC crude oil quota limitations.

Kuwait only produces only a modest quantity of natural gas. Production stood at 330 billion cubic feet (Bcf) in 1998 - most of it associated gas from oil production. Kuwait does, however, plan to make a significant increase in its use of natural gas, in order to free up a substantial amount of oil for export. Kuwait and Qatar signed a Memorandum of Understanding (MOU) in July 2000 for export of Qatari gas from its offshore North Field to Kuwait. Kuwait also signed an MOU with Iran for the import of gas via pipeline in July 2000. It is unclear whether the two gas import projects can both go forward. Saudi Arabia and Kuwait concluded an agreement in July 2000 on the offshore Dorra gas field, which had been claimed by Saudi Arabia, Kuwait, and Iran. The agreement calls for an equal sharing of the gas resources between Saudi Arabia and Kuwait.

Oil revenues account for about 90% of Kuwait’s government income (and nearly half the country’s GDP), and this does make Kuwait vulnerable to low oil prices. The “oil crash” led to a serious recession in 1997 and 1998. Under most conditions, however, Kuwait is one of the few oil exporting states that can remain relatively wealth be remaining highly dependent on oil. Sharp increases in oil prices in early 1999 have already demonstrated this. Kuwait’s economy is

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expected to grow by 4.5% in real GDP in 2000. Kuwaiti oil export revenues are expected to increase sharply in 2000, to $16.2 billion, up 62% from 1999 revenues and more than double 1998 revenues.[117]

Internal versus External Security Issues

Increases in oil production capacity will ensure that Kuwait remains in different economic position from Saudi Arabia. Kuwait still has a small native population: Only about 780,000 or 35% of its total population of 2.2 million.[118] It has enough oil reserves and foreign investments, so that it is unlikely to undergo severe internal strains for economic reasons. Kuwait has been slow to modernize some of its energy sector and open it up to private and foreign investment.

Kuwait does, however, have all of the same structural economic problems as Saudi Arabia, and is grossly over-dependent on foreign labor. Its moves towards representative government have done to more to create service politics based on narrow factional greed than effective government, and it has created a "lost generation" of Kuwaiti youth where far too many young Kuwaitis have meaningless government jobs. This means there are basic social issues that Kuwait must address.

Kuwait's Security and the Continuing Threat from Iraq

The fact remains, however, that US policy must focus on the external threats to Kuwait. As Iraq's invasion of Kuwait demonstrated with consummate brutality, Kuwait's geography, small size, and limited population also make it one of the most vulnerable Gulf states. Its location on Iraq's border has been the source of continuing Iraqi threats, military confrontation, and actual invasion. Kuwait is located in the far northwestern corner of the upper Gulf between Iraq and Saudi Arabia, and within a short distance of Iran.

While Kuwait may be one of the world's major oil powers, it has a total area of only 17,800 square kilometers -- roughly the size of New Jersey. At its largest point, Kuwait is about 200 kilometers from north to south and 170 kilometers from east to west. It shares a 242-

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kilometer border with Iraq and a 222-kilometer border with Saudi Arabia. It has a 499-kilometer coastline on the Gulf, and its territory includes nine islands. Bubiyan and Warbah -- two large islands in the north -- are uninhabited but are of strategic importance, because they border the Umm Qasr channel, which is Iraq's only waterway with direct access to the Gulf.[119]

Kuwait is keenly conscious of the fact that Saddam Hussein remains in power, that Iraq has not abandoned its desire to annex Kuwait, and that Kuwait is dependent on the U.S. for its survival. At the same time, Kuwait can only provide limited forces for its own defense. It will remain dependent on the US indefinitely into the future, and there are no alternative options the US can realistically pursue

Iraq has not forgotten its desire to make Kuwait its "19th Province," or forgiven Kuwait for the aftermath of the Gulf War and its support of sanctions. It has other reasons to behave as a revanchist state. The new border the UN demarcated after the Gulf War gave Kuwait considerable advantages at the expense of Iraq. It gave Kuwait greater control over the Ratga and Rumalia oil fields in its northern border area, and reduced Iraqi access to the port facilities at Umm Qasr. At the same time, the new border created political problems. Only six days after the Secretary-General accepted the report, the Speaker of Iraq's National Assembly stated that the new border would keep tensions in the region high. Iraq has never really accepted the new demarcation and Iraqi editorials media make this clear.

The Ratqa field has since been the subject of major controversy between the two countries. While it was once. thought to be an independent reservoir, the EIA reports that it is actually a southern extension of Iraq's super-giant Rumaila field. Iraq accused Kuwait of stealing billions of dollars worth of Rumaila oil just before it invaded Kuwait, and refused to negotiate a sharing or joint development arrangement. After the Gulf War of 1991, a United Nations survey team made a demarcation of the border between Iraq and Kuwait, and it was this demarcation put all 11 of the existing wells at Ratqa within Kuwaiti territory.[120]

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Iraq's leadership is unlikely to end its claims to part of Kuwait's Ratqa oilfield even if it accepts the existence of an independent Kuwait. Making matters worse, Iraq disputed its border with Kuwait, and in fact claimed the entire country as part of Iraqi territory. During the weeks preceding Iraq's August 1990 invasion of Kuwait, Iraq accused Kuwait of stealing "billions of dollars" worth of Rumaila oil, and had refused to negotiate a sharing or joint development arrangement for Ratqa and southern Rumaila. Kuwait's new U.N.-drawn border includes a 1919-foot extension for Ratqa further to the north. Iraq renewed these criticisms in September of 2000, claiming that Kuwait was stealing oil from the Iraqi people.

It seems likely that Iraq will create problems in the Iraqi-Kuwaiti border area the moment it is given the political and military opportunity. Kuwait has already had to delay plans to allow Western oil companies to explore and develop its oil fields near the Iraqi border because of the risk of new clashes. Iraq, on the other hand, is aggressively attempting to negotiate deals with nations like Russia to exploit the fields on its side of the border once the UN sanctions are lifted. Kuwait, the U.S, and other allied nations have already been forced to react to Iraqi provocations in 1992, 1994, 1996, 1997, and 1998. At least one of these provocations were large enough to pose a threat of invasion.

Kuwaiti Military Capabilities

Kuwait has spent some $2.3 to $3 billion annually on defense in recent years. Amd spent $2.6 billion in 2000. It signed a total of $7.2 billion in new arms agreements between 1991 and 1999. Some $4.2 billion came from the US, $2.0 billion from Europe, and $800 million from Russia. It took delivery on $7.6 billion during the same period, $4.9 billion came from the US, $1.8 billion from Europe, $800 million from Russia, and $200 million from China, and $100 million from other countries.[121]

Nevertheless, Kuwait only has total active forces of some 15,300 men – including 1,600 foreign personnel -- with an additional 5,000 men in its National Guard. Its army has only 11,000 men, and three small active brigades – three armored, two mechanized, and one reconnaissance

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(mechanized infantry) brigade. These forces actually are reinforced battalions, two brigades are little more than reserve cadres, and one is more a guard unit than a full combat unit.

The land forces deploy 218 M-1A2 Abrams tanks, and has 150 M-84s and 17 Chieftains, at least 50% of which are in storage. Kuwait army units are well-equipped with modern armored personnel carriers (APCs) and armored infantry fighting vehicles for a force of its size, and its holdings include 254 Desert Warriors, 60 M-113s, 40 M-577s, 46 BMP-2s and 55 BMP-3s. It has 41 active 155mm self-propelled artillery weapons, including 23 US-made M-109 A2s. It has 27 Smerch 9A52 multiple rocket launchers, and some towed artillery weapons and mortars. It has modern antitank weapons and adequate light antiaircraft systems. It has good logistic equipment.[122]

Kuwaiti land forces are far too small to defend against Iraq, and Kuwait has not developed a meaningful conscription system. Kuwaiti training is steadily improving, but it is not ready to execute sustained maneuver warfare. Saudi land forces are not properly organized and trained to reinforce and cooperate with Kuwait land forces, and Saudi-Kuwaiti planning and cooperation is grossly inadequate above the battalion level. Kuwait would lack meaningful prospect of major reinforcement from the other Southern Gulf states that would help in an intensive war against Iraq

The Kuwaiti Air Force has only 2,500 men, 82 combat aircraft, 20 armed helicopters, and 4 surface-to-air missile batteries. The core of its forces consist of 40 F/A-18 multirole fighters 14 aging Mirage F-1CK/BKs, 12 Hawk 64 trainers, 16 Shorts Tucano trainers, and 16 SA-342 attack helicopters armed with HOT anti-armored missiles. Its surface-to-air missile batteries. These forces include four IHAWK III batteries with 24 launchers, and six Amoun batteries, each with one Skyguard radar, two Aspide launchers, and two twin 35-mm Oerlikon AA guns. It also has 48 Starburst launchers. are well equipped and trained, although they would have to depend heavily on US sensor and battle management support in any major engagement. These air units are far too small to conduct a large defensive air battle without US and Saudi aid, and could only play a limited role in halting an Iraqi land advance.

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The Kuwait Navy has only 1,800 men and 11 patrol craft. Eight of these ships are relatively modern missile patrol craft, six with Sea Skuas and two with Exocets. The Air Force has four armed AS-332 helicopters that also have a transport and search and rescue mission. The navy has no dedicated mine warfare forces. It has no real warfighting capability and is sized largely to patrol and screen Kuwait waters and deal with small incursions. In any major conflict, Kuwait would have to rely on US and British naval forces.

The paramilitary forces include a 5,000-man National Guard with six company-sized battalions, and a some Coast Guard with four small patrol boats and 30 armed light craft.

The Pivotal Role of U.S. Power Projection Forces

The limits to Kuwaiti, Saudi, and other Southern Gulf forces means that guarding Kuwait poses a continuing and critical challenge to U.S. power projection capabilities. These problems are reinforced by the presence of large Iraqi land forces near Kuwait, the sheer distance between Kuwait and the US, and by the fact Kuwait's flat territory makes it so exposed to invasion. These challenges will grow sharply if Iraq can break out of sanctions, rearm, and rebuild its weapons of mass destruction.

If U.S. and British forces had not been continuously deployed in the Gulf, it is doubtful that Kuwait would have survived Iraq's desire for revenge. U.S. power projection has had to play a continuing role in ensuring the security of Kuwait and Gulf energy exports since the Gulf War. As early as August and September of 1992, the confrontation between Iraq and the UN over the elimination of weapons of mass destruction, and Iraq's treatment of its Shi'ites and Kurds, forced Kuwait and the U.S. to transform their joint exercises into a demonstration that the U.S. could protect Kuwait against any military adventures by Iraq. The U.S. rushed Patriot batteries to both Kuwait and Bahrain, and conducted a test pre-positioning exercise called Native Fury 92 and an amphibious reinforcement exercise called Eager Mace 92. The U.S. also deployed a 1,300-man battalion from the 1st Cavalry division, 1,900 Marines and 2,400 soldiers, including two armored and two mechanized companies.

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Since that time, the U.S. has repeatedly had to use force or rapid deployments from the U.S. to contain Iraq, maintain a near-permanent carrier task force in the Gulf, keep a brigade set prepositioned in Kuwait, base aircraft in Turkey and the Southern Gulf to maintain the 'no fly' zones in Iraq, and maintain a network of force deployments and prepositioning capabilities in virtually every Southern Gulf country. The U.S. and Britain launched cruise missile strikes on Iraq on two other occasions, and conducted major air and missile strikes on Iraq in December 1998, as part of Operation Desert Fox. Since that time, the U.S. and Britain have fought a steady low-level air defense war with Iraq in both the Northern and Southern "No-fly zones."

Iraq is not the only issue. While Kuwait has established relatively close relations with Iran – and has joined Saudi Arabia and Oman in maintaining a high level of dialogue with the Iranian government – Iran has been hostile in the past. It was responsible for major bombings in Kuwait during the Gulf War, and deployed combat aircraft and ships in threatening ways. It was Iran that triggered the reflagging of Kuwait tankers with US flags in 1987, and the "tanker war" between the US and Iran that followed. US forces in the Gulf also act as a powerful deterrent to and Iranian threat to Kuwait.

Kuwait and Collective Security in the Southern Gulf

Given this background, it is hardly surprising that Kuwait is an important US military ally in the Gulf region. The history of US and Kuwait military cooperation since the Gulf War clearly demonstrates this fact: [123]

- Until the tanker war of 1987-1988, Kuwait attempted to maintain its security by balancing the competing political and military interests of its neighbors in ways where it could obtain support from a wide range of countries and defuse potential threats through financial aid or political accommodation. Kuwait then obtained the reflagging of its tankers from the US during the tanker war, cooperated closely with the US to ensure its security against Iran, and bought US F/A-18 aircraft to modernize its air force.

- The US and Kuwait cooperated closely after Iraq's invasion of Kuwait, and Kuwait provided the US with $16.056 billion in direct aid during the Gulf War, and $44 million in goods and services, for a total of $16.059 billion.[124] The US played a key role in helping Kuwait to rebuild its military forces before the liberation of Kuwait, and this help enabled Kuwait to deploy some 7,000 troops and 60 tanks as part of the Saudi-led Joint Force Command (East).[125]

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- Less than 200 trained Kuwaiti Air Force personnel were in service at the start of Desert Storm, but Kuwait used French Air Force and US contract personnel to support its 15 operational Mirage F-1s, and 19 A-4s. The Kuwaiti Air Force also had 12 armed helicopters. Kuwaiti units flew 568 interdiction missions and 212 battlefield interdiction missions for a total of 780 sorties. About 650 of these sorties were A-4 sorties, and Kuwaiti A-4s flew an average of about 18-20 sorties per day. Kuwaiti Mirage F-1s flew the remaining 130 sorties, flying 4 to 10 sorties per day. Operational availability rates averaged 80-85% per day. Kuwait lost one A-4 on the first day of fighting, but attacked Iraqi artillery and infantry locations, and some Iraqi air defense positions throughout the war.

- The US Fifth Special Forces trained some 6,300 Kuwaitis for the Free Kuwait Forces, and the US Navy Special Forces Command trained 224 Kuwait marines and sailors.

- Since the Iraqi invasion of Kuwait, Kuwait has signed security agreements with Britain, France, Russia, and the US. Kuwait signed a 10 year bilateral agreement with the US on September 19, 1991. This agreement provided for $35 million per year in Kuwaiti payments to offset the cost of US military support.[126]

- Kuwait now relies heavily on the US to help it in rebuilding and expanding its military forces, and its military facilities are being sized and redesigned to support the rapid deployment, support, and sustainment of US land and air units. A US-Kuwait Defense Review Group helps coordinate these efforts.

- Kuwait is equipping much of its force structure with US Army and US aircraft, and has bought 40 F/A-18s and M-1A2 tanks, M-2/M-3 armored fighting vehicles, and US artillery, and Kuwait has support contracts with US defense contractors that provide it with increased sustainability as well as increased capability to support the deployment of US forces. The US has an Office of Military Cooperation in Kuwait.

- Kuwait supports the US in maintaining USAF combat aircraft on Kuwaiti soil -- including 24 USAF A-10 attack aircraft based at Ahmed Al-Jaber air base. It is creating a new air base in southern Kuwait to facilitate rapid US air deployments in the most defensible part of Kuwaiti air space.[127] Kuwait has bought $145.6 million worth of US military construction services since the Gulf War.[128]

- Kuwait allows a cadre of US Army personnel to be stationed in Kuwait, and is paying $215 million to finance the prepositioning of the combat equipment of one US Army mechanized brigade (three armored companies and three mechanized companies) -- including 58 M-1A2 tanks, M-2A2 Bradleys, and M-109A6 Paladin artillery weapons. A company of US Army military police provides security for the equipment and 600 employees of the DynCorp are responsible for its maintenance.

- The Kuwaiti C^4I system is now interoperable with that of US forces. The C^4I links for the US-operated Patriot units in Kuwait are linked to those for Patriot units in Saudi Arabia and to US satellite warning systems that detect the nature and vector of missile launches.

- Kuwaiti land, air, and naval forces now conduct extensive combined training with the US. Kuwait and the US held at least eight major exercises between November, 1991 and January, 1995, including “Eager Mace,” “Intrinsic Action,” and “Native Fury.” These exercises include practicing the unloading of tanks from prepositioning ships and the defense of Kuwait City from an Iraqi invasion.

- Kuwait and the US conducted Operation Vigilant Warrior in early October, 1994, in response to the build-up of 70,000-80,000 Iraqi troops, 1,100 tanks, 1,000 AFVs, and 700 artillery pieces in the border area. Kuwait provided major offset aid, air and kind, and facility support as the US began supplementing the

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13,000 troops already deployed in Kuwait with the 1st Marine Expeditionary Force, 24th Infantry Division, and added Patriot forces.

US advisors now work closely with Kuwait military forces, and US and Saudi forces have steadily improved their interoperability and experience in joint exercises. Kuwait has also bought large amounts of modern US military equipment since the Gulf War. During 1992-1999, Kuwait signed $3.7 billion worth of new US arms agreements out of a total of $7.2 billion, and took delivery on $4.9 billion worth of arms out of a total of $7.4 billion.[129] Kuwait has provided basing and other support to US in operations against Iraq in the Southern No Fly Zone, in building up forces to deter Saddam Hussein's adventures since the Gulf War, and during Operation Desert Fox in December 1998. [130]

Implications for US Policy

Kuwait does not face the same economic challenges as Saudi Arabia, but it is considerably more vulnerable. The US has already made major progress in improving the quality of Kuwait's military forces and Kuwait has provided major assistance in improving US ability to reinforce Kuwait in an emergency. There again, however, are areas where further improvements are needed in US policy:

- *The US needs to actively support Kuwaiti efforts at economic reform, encourage Kuwait to persist in these plans, and to do everything it can to encourage US industry to help when Kuwait offers competitive opportunities.*

- *Kuwait will be the second-most important nation in shaping the success of a more active US energy policy in the Gulf region.* It will play a major role in determining the success to any dialogue on price stabilization and on ensuring the successful expansion of oil exports. Once again, improving the flow of foreign and domestic private investment may prove critical to ensuring suitable energy supplies.

- *A gentle dialogue is needed to push Kuwait towards reducing its dependence on foreign labor, and developing competitive educational programs that train its youth for real-world jobs.*

- *There are a serious limits to what Kuwait can do to improve its military forces, and it has already done a great deal to help the US improve its power projection capability. The main strategic weakness affecting Kuwait, however, is the lack of a truly*

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integrated Kuwaiti-Saudi effort to defend against Iraq and over reliance on the US to improvise an effective defense in an emergency. Some progress has been made at the small unit level, but the real-world key to collective security in the Gulf is not the GCC, but the combination of Kuwaiti, Saudi, and US capability to deter and defeat Iraq. The often petty tensions between Kuwait and Saudi Arabia that limit effective cooperation, and the lack of offensive capability in the Saudi Air Force has seen a serious decline in readiness in, and lack of Saudi Army organization and training to defend the Saudi border and Kuwait against Iraq represent the most serious single weakness in Southern Gulf military capabilities. These are key contingency capabilities the US needs to help develop, and they are far more important priorities than efforts to strengthen the entire GCC or improving force-wide capability without prioritization by mission.

- *Kuwait has good military leadership and USCENTCOM has already created an effective engagement strategy that stresses training and maintenance, and a focus on making forces existing weapons and forces effective, rather than showpiece arms buys.* [131] *The basic problem is not US arms sales policy, however, but a longstanding Kuwait tendency to politicize arms purchases and buy from a range of influential countries at the cost of military effectiveness*. This problem has been made worse by the tendency of the Kuwaiti National Assembly to micromanage Kuwaiti modernization and arms buys without having the experience to do so. The US should expand the USCENTCOM engagement strategy to explain how the US effort to help Saudi Arabia improve its military capabilities is in the interest of the Saudi people and is cost-effective for the Kingdom. The US needs to worry more about explaining the "legitimacy" of its security effort in the region.

- *US capability to rapidly deploy ground forces to Kuwait, and deploy massive amounts of air and missile power to halt an Iraqi ground invasion the moment it begins is the most critical sizing criteria for US forces in the region*. It is impossible to determine how good US capabilities now are on the basis of unclassified data, but it seems clear that they have been underfunded in terms of both readiness and force modernization. This capability needs zero-based examination by USCENTCOM that is not subject to rigid adherence to existing funding and force allocation constraints.

The United Arab Emirates (UAE)

The UAE is a federation of seven emirates - Abu Dhabi, Dubai, Sharjah, Ajman, Fujairah, Ras al-Khaimah, and Umm al-Qaiwain. Political power is concentrated in Abu Dhabi, which controls the vast majority of the UAE's economic and resource wealth. The EIA estimates that the two largest emirates -- Abu Dhabi and Dubai -- provide over 80% of the UAE's income.[132]

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The UAE has slowly become a real country, rather than a loose confederation of emirates left over from British withdrawal from the Gulf. In June 1996, the UAE's Federal National Council approved a permanent constitution for the country. This replaced a provisional document that had been renewed every five years since the country's creation in 1971. The establishment of Abu Dhabi as the UAE's permanent capital was one of the new framework's main provision. [133]

Nevertheless, the UAE still bears a slight resemblance to the Holy Roman Empire in its lack of coherence. It is a legacy of the time the Trucial States of the Persian Gulf coast granted Britain control over their defense and foreign affairs in 19th century treaties. When Britain withdrew from the Gulf in 1971, six of these states - Abu Zaby, 'Ajman, Al Fujayrah, Ash Shariqah, Dubayy, and Umm al Qaywayn - merged to form the UAE. They were joined in 1972 by Ra's al Khaymah, after Ra's al Khaymah lost a dispute with the Shah of Iran over the control of three islands in the Gulf. There are still long-standing tensions between its largest Emirates (Abu Dhabi, Dubai, and Sharjah), and the less wealthy mini-states to the east. Most of its population is not Arab, and consists of foreign workers. Only the word "Emirates" accurately describes the country. It remains a rentier nation composed of seven small city-states ruled emirs.

Political stability may be an issue in the future. Much of the UAE's stability has depended on the political skills of Sheik Zayid bin Sultan Al Nuhayyan, the ruler of Abu Dhabi, and his ability to use diplomacy and Abu Dhabi's oil wealth to hold the UAE together. Sheik Zayid is aging and his sons have yet to show they can replace his political skill. Dubai is particularly conscious of its status, and there are low-level concerns that the Eastern Emirates might seek independence or that Oman might seek to include them in its territory. It seems much more likely, however, that the succession in Abu Dhabi will proceed relatively smoothly, and that the individual emirates will continue to evolve towards unity, rather than divide.

Political reform is moving slowly in the UAE. It is wealthy enough to coopt most potential opposition – as is likely to remain so indefinitely into the future -- but change is creating a new class of intellectuals who will probably seek participation in government. Many are supporters of

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close strategic relations with the US and see Iran as a major threat. Some, however, are serious critics of many aspects of US policy. The presence of U.S. power projection forces, US support of Israel and slow progress in the Arab-Israeli peace process, arms sales to the UAE, and the "hardship" sanctions have imposed on the Iraqi people, have all become political issues. Many intellectuals are now calling for a Gulf security structure that eliminates a U.S. presence.

As yet, there are few signs of active internal political tension. There have, however, been riots between Hindu and Pakistani foreign workers. The UAE has a total population of about 2.4 million and 75% is expatriate, with 30% Indian, 16% Pakistani, 12% Arab, 12% other Asian, and 1%. Only 19% are legally Emiri and less than 20% are UAE citizens. The military is at least 30% expatriate. There is at least some question of how long the landlord will actually control the country.[134]

Population growth also does put some strain on even the UAE's oil wealth. The United Arab Emirates grew from 1.0 million in 1980 to 2.7 million in 1998. It is projected to grow to 3.7 million in 2015, and 4.3 million in 2030. It averaged 5.3% annual population growth during 1980-1998. This growth helped cut the UAE's real per capita income by an annual average of 3.6% during 1965-1998.

The UAE and Energy

Oil and gas wealth, and vulnerability, are the glue that holds the UAE together. Despite some disunity, money still talks and oil and trade give the UAE's ruling elites the resources to provide major subsidies and benefits. The UAE has oil reserves of 97.8 billion barrels, or about 9.4% of the world's total, and gas reserves of 212 trillion cubic feet or about 4.1% of the world total.[135] Abu Dhabi holds 94% of this amount, or about 92.2 billion barrels. Dubai contains an estimated 4.0 billion barrels, followed by Sharjah and Ras al-Khaimah, with 1.5 billion and 100 million barrels of oil, respectively.[136] It is also one of the world's large oil producers. The UAE will earn at least $20 to $25 billion in oil export revenues in 2000, up well over 160% from 1999 and far more than double 1998 revenues.

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As with other Gulf countries, the sharp increase in oil prices in 1999 and 2000 has significantly improved the UAE's economic and budgetary situation, which was never under serious stress even during the "oil crash" of 1997-1998. Its real GDP is forecast to grow by at least 5.2% in 2000, up from 5% growth in 1999 and a 5% decline in 1998, and may well exceed 8%. The UAE is expected to export around 1.9 million bbl/d in 2000, up slightly from 1999 oil export levels.[137]

The U.S. Department of Energy estimates that the UAE will increase its production capacity from 2.5 million barrels per day in 1990, and 2.7 million barrels per day in 1998, to 3.2 (2.8-3.4) million barrels per day in 2005, 3.6 (3.3-4.2) million barrels per day in 2010, 4.2 (3.9-5.5) million barrels per day in 2015, and 5.1 (5.2-7.2) million barrels per day in 2020. [138] These figures are somewhat misleading, however, because each emirate controls its own oil production and resource development under the UAE's constitution,. Furthermore, although Abu Dhabi joined OPEC in 1967 (four years before the UAE was formed), Dubai does not consider itself part of OPEC or bound by its quotas. Consequently, if Dubai were to produce at its full capacity, Abu Dhabi would have to adjust its output in order to keep the UAE within its OPEC production quota.[139]

Many of the UAE's oil fields have been producing since the 1960s. Even so, but the proven oil reserves in Abu Dhabi have doubled in the last decade, and there have been major increases in rates of recovery. Abu Dhabi has continued to identify new finds, especially offshore, and to discover new oil-rich structures in existing fields. The Abu Dhabi National Oil Company (ADNOC) is the key national firm shaping the UAE's energy development.

The UAE's natural gas reserves of roughly 212.0 trillion cubic feet (Tcf) are the world's fourth largest after Russia, Iran, and Qatar. The largest reserves of 196.1 Tcf are located in Abu Dhabi. Sharjah, Dubai, and Ras al-Khaimah contain smaller reserves of 10.7 Tcf, 4.1 Tcf, and 1.1 Tcf, respectively. The non-associated Khuff gas reservoirs beneath the Umm Shaif and Abu al-

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Bukhush oil fields in Abu Dhabi rank among the world's largest. The EIA projects that current gas reserves are projected to last for about 150-170 years.

The EIA reports that Dubai's gas consumption is expected to grow by nearly 7% each year through 2005, due to expansion of its industrial sector, a switch to gas by its power stations, and the need for an enhanced oil recovery (EOR) system based on gas injections for its dwindling oil formations. Dubai projects future demand will average 655 Mmcf/d in 2000 and 810 Mmcf/d in 2005, with major swings between summer and winter consumption patterns. Currently, Dubai's entire gas supply comes from fellow UAE member Sharjah, which transports about 430 Mmcf/d, but Dubai will be connected to the main Abu Dhabi gas receiving station by a pipeline. The pipeline's capacity is expected to be around 800 Mmcf/d; 400-600 Mmcf/d is to be supplied to Dubai. [140]

The UAE has launched a massive multi-billion dollar program of investment in its gas sector including a shift toward gas-fired power plants and the transformation of the Taweelah commercial district into a gas-based industrial zone. An ambitious plan to interconnect the gas grids of Qatar, the UAE, and Oman, called the *Dolphin Project*, is now underway. It will allow the export of non-associated gas from Qatar's massive offshore North Dome field. It is estimated to cost $8 to $10 billion over the next six to seven years, and will begin as an underwater pipeline from Ras Laffan in Qatar to a landfall in Abu Dhabi, which will then be extended to Dubai and northern Oman. There is discussion of an extension of this pipeline from Oman to Pakistan, to carry 1.5 Bcf/d and be built after 2005. This phase of the project is dependent uncertain cost-effectiveness calculations regarding its construction costs and feasibility, and on Pakistan's ability to pay for the gas, which is questionable. [141]

Oil and gas exports account for about 33% of the GDP, and have helped give the UAE has a high per capita income, which totaled around $17,700 in 1999. The UAE has undertaken major several projects to diversify its economy and reduce dependence on oil and gas revenues. The federal government has invested heavily in aluminum production, tourism, aviation, re-export

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commerce, and telecommunications, agriculture remains a significant – if inefficient and water wasting – part of the UAE's economy. Dubai has become a central Middle East hub for trade and finance, and accounts for about 70% of the Emirates' non-oil trade. The UAE implement some important reforms during the "oil crash." It increased spending on job creation and infrastructure expansion and began to open up its utilities to greater private-sector involvement.[142]

The UAE and Gulf Security

The UAE's principal foreign threat is Iran, which is also one of its major trading partners – particularly with Dubai. The key to this dispute between the two countries is a dispute over sovereignty over three small and arid islands that divide the major shipping channels in the Gulf: Abu Musa, the Greater Tunbs, and Lesser Tunbs.[143]

Iran effectively seized all three islands from the nominal control of Ras al Khaimah when the British left the Gulf in 1971, and did so with at least tacit British compliance. Ras al Khaimah, which later became part of the UAE was given a face-saving compromise and jurisdiction over the small Arab population on Abu Musa. The island dispute is further complicated by the development of Mubarak field in the Gulf. It is located six miles off Abu Musa, and has been producing gas-rich oil since 1974.

This strange combination of de facto Iranian sovereignty, and a limited political role in the islands for the UAE survived the Iranian Revolution and the Iran-Iraq War. It came as something of a surprise, therefore, when Iranian troops effectively occupied all three islands in 1992. In 1995, the Iranian Foreign Ministry went further, and claimed that the islands were "an inseparable part of Iran." Iran rejected a 1996 proposal by the Gulf Cooperation Council (GCC) for the dispute to be resolved by the International Court of Justice, an option supported by the UAE. In early 1996, Iran took further steps to strengthen its hold on the disputed islands. These actions included starting up a power plant on Greater Tunb, opening an airport on Abu Musa, and announcing plans for construction of a new port on Abu Musa.[144]

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The UAE has received political and diplomatic support from the GCC, the United Nations, and the United States in its efforts to restore its position on the islands. The UAE officials in Abu Dhabi have chosen not to try to escalate the dispute in ways that would lead to the use of force. This is partly because of the risk such a conflict could escalate to a major and lasting confrontation between the UAE and Iran, partly because of the UAE's military weakness, and partly because none of the UAE's allies see the dispute as either a case of naked aggression or worth a conflict. This is because Iran is one of Dubai's major trading partners, accounting for 20% to 30% of Dubai's business.

The UAE has repeatedly reasserted its claims to sovereignty, sought support from bodies like the GCC, and tried to bring the issue to the World Court. Iran, however, has resisted any efforts to internationalize the dispute, and continues to take a firm position that the islands are sovereign Iranian territory – a position it also took under the Shah. It seems doubtful that the dispute will escalate to open conflict. Nevertheless, the dispute is a key rationale for the UAE's military build-up.

The dispute over the islands has also created some animosity between the UAE and Saudi Arabia in 1998-1999. Saudi Arabia and Iran made attempts to reconcile their differences and improve their relations during this period and these attempts were met with harsh criticism from the UAE who were angered by what they felt was Saudi abandonment of their claim to the islands. The two nations exchanged heated remarks, and the dispute seemed to have the potential to become a serious issue between the UAE and Saudi Arabia, but it was resolved through Qatari mediation. Saudi Arabia, Qatar, and the UAE established a committee in the GCC dedicated to resolve the conflict and planned summit negotiations in the future. Other potential disputes include past Omani claims to territory in the UAE, and past border problems with Qatar and Saudi Arabia.

More is involved, however, than politics. Relations have also been strained by Saudi development of the Shaybah oilfield, with estimated reserves of 14 billion barrels of crude oil. The

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UAE and Saudi Arabia do not have a precisely defined border in desert separating them, and the Shaybah field straddles territory claimed by both countries. Saudi Arabia began production from the Shaybah field in late 1998, and the UAE has demanded an agreement to share production from Shaybah.[145]

UAE Military Capabilities

The UAE has spent some $13.7 to $14 billion annually on defense in recent years. It signed a total of $15.0 billion in new arms agreements between 1991 and 1999. Some $600 million came from the US, $13.4 billion from Europe, $400 million from Russia, and $200 million from other countries. It took delivery on $7.8 billion during the same period, of which $1.1 billion came from the US, $1.8 billion from Europe, $600 million from Russia, and $500 million from other countries.[146] This is an exceptionally high level of expenditure for a force of some 64,500 men, some 30% of which are expatriates.

Its army has a strength of 59,000 actives, and has six active brigades – one armored, two mechanized, two infantry, and one royal guard. It is deploying 156 modern Le Clerc tanks, and has 81 aging AMX-30s and OF-40s. The procurement of Le Clercs will eventually give it about two Western brigades worth of modern main battle tanks. It has 570 armored personnel carriers (APCs) and 558 armored infantry fighting vehicles, including 415 modern BMP-2s. It has 177 active 155mm self-propelled artillery weapons, including 87 US-made M-109 A3s and 72 G-6s, plus an adequate number of towed artillery weapons and mortars. It is equipped with modern anti-tank guided weapons and light anti-aircraft weapons.[147]

The UAE's land forces are, however, something of a hollow shell. Its manning is inadequate, and it is over-dependent on expatriates. Overall training is poor, and it organized more to fight its Southern Gulf neighbors than to project land power. Training above the battalion level is weak, particularly in combined arms and joint operations. Logistic equipment and stocks are good, but the organization and training are weak. More emphasis has been placed on equipment quality and numbers than effective warfighting capability. The potential saving grace is

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that Iran has only limited offensive sealift and has never practiced major combined arms amphibious landings with serious forced entry capability.

The UAE Air Force has a total of 4,000 men, some 101 combat aircraft, 49 armed helicopters, and 5 I Hawk surface-to-air missile batteries. Its first line air strength now includes 45 Mirage 2000s in various configurations, 10 SA-342K armed helicopters with HOT antitank missiles, and three AS-332 armed helicopters with Exocet antiship missiles. The Mirage 2000 is a capable combat aircraft, and the UAE is buying large numbers of modern F-16 Block 60 fighters, which will be some of the most advanced combat aircraft in region and much more advanced than any combat aircraft in service in Iran.

The UAE air force does, however, lack modern maritime surveillance and any airborne warning and air control system (AWACS) aircraft, and airborne refueling capability, and a modern land-based air defense sensor and control network. It has good average aircrew training levels. Readiness and aircrew numbers are inadequate, and the UAE air force has only limited capability for joint warfare and proficiency in offensive operations. It cannot manage a large defensive air battle against Iran without US aid, and most potential Southern Gulf air reinforcements lack the readiness and proficiency to be integrated into a major air battle against Iraq.

The UAE Navy has some 2,000 men. It has two modern missile frigates, two missile corvettes, and eight missile craft --all armed with Exocet antiship missiles. It also has eight inshore patrol craft and five amphibious craft. While these ships are limited in size and number, they are more capable than most of their equivalents in the Iranian Navy. Unfortunately, it is far better equipped than manned and trained, and is only beginning to develop an effective capability for surface warfare. It has little current mine, antisubmarine, and surface-to-surface missile warfare capability. It can, however, perform a maritime surveillance and escort mission, and supplement US and British naval action.

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The UAE, the US, and Collective Security in the Southern Gulf

The UAE has not played as intensive a role in supporting US security policy in the Gulf as Kuwait, Saudi Arabia, Bahrain, and Oman. The US did not begin to develop close security arrangements with the UAE until the tanker war of 1987-1988, but the US and UAE cooperated closely during both the tanker war and Gulf War. The UAE provided port call facilities and support during Operation Earnest Will, and cooperation between the US and UAE has improved steadily since the Iraq's invasion of Kuwait: [148]

- The US Navy and MEF conducted a combined exercise with UAE in July, 1990, after Saddam Hussein began to threaten the UAE.

- The UAE provided the US with $6.572 billion in direct aid during the Gulf War, and $218 million in goods and services, for a total of $6.455 billion.[149] The UAE committed a Motorized Infantry Battalion to Joint Forces Command (East) and created a combined aviation battalion with Kuwait. It used its 7,000-man air force to fly 109 sorties, including 58 Mirage 2000 interdiction sorties, 45 C-212 and C-130 airlift sorties, and six Mirage 2000 reconnaissance sorties. The UAE Air Force had reasonable readiness. It canceled or aborted 18 sorties, but only two due to maintenance reasons. Its Mirage 2000 fighters attacked targets like Iraqi infantry and mechanized forces, artillery positions, and supply areas.[150]

- The UAE negotiated a security arrangement with the US in 1992 that offered the US access to UAE air and naval facilities. The UAE and US signed a Defense Cooperation Agreement on July 23, 1994.

- A small amount of US Navy equipment is prepositioned at Jebel Ali and a small US Navy support facility exists in Fujairah. US Navy ships make regular port calls to the UAE -- Jebel Ali is one of the most frequent port calls in the world for the US Navy. Fujairah, on the Gulf of Oman, also allows the US to provide logistic support to reach destinations in the Gulf without going through the Straits of Hormuz by moving from ports in Fujairah along a modern highway to locations in the Southern Gulf.

- In 1995, the UAE agreed to host a US Army prepositioned brigade with 120 tanks and 70 AIFVs. An agreement in principle has already been signed and negotiations are underway over cost-sharing.

- UAE forces have conducted combined air exercises with the US. The UAE deployed a squadron of fighter aircraft to Kuwait when Iraqi forces moved towards the Kuwaiti border in October, 1994.[151]

- UAE forces have increasing amounts of US equipment, and the US has a military liaison office in the UAE with six military, one civilian, and two local personnel to manage military programs in the country.

The UAE and US have steadily improved their cooperation in military exercises since the Gulf War, and the UAE could play a role in US operation against Iran or to secure shipping traffic in the Gulf. The UAE has relied largely on European military suppliers in the past, but it still bought significant amounts of modern US military equipment after the Gulf War. During 1992-

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1999, the UAE signed only $600 million worth of new US arms agreements out of a total of $15 billion, and took delivery on $1.1 billion worth of arms out of a total of $7.7 billion. The UAE has, however, recently made a massive buy of F-16s, which will greatly increase its interoperability with US forces and ability to support the USAF in US power projection into the region.

Implications for US Policy

The US the same major policy goals in the UAE that it has in the rest of the Southern Gulf: To ensure the security of the UAE, to ensure the smooth flow of oil at moderate prices, and to ensure the development of the UAE's oil reserves to meet the demands of the global economy. In broad terms, US policy has been successful in meeting these objectives, but once again there are areas with the US does need to make improvements:

- *The US needs to prepare for a post-Zayid political leadership in the UAE, although there is little it can do other than urge a smooth transition in the Abu Dhabi, and that Dubai, Sharjah, and the smaller Emirates continue the present power sharing arrangements and movement towards a more unified and modern form of government.* One key to the success of such US policy will be supporting UAE economic reforms, measures to limit dependence on foreign labor, and more effective measures to transfer capital from the wealthier Emirates, particularly Abu Dhabi and Dubai, to aid in the development of the poorer eastern Emirates.

- *As is the case with Saudi Arabia and Kuwait, the UAE will play a critical role in shaping the success of a more active US energy policy in the Gulf region, and of any dialogue on price stabilization and ensuring the successful expansion of exports.* Once again, the flow of the required investment is critical to ensuring suitable energy supplies, although the UAE can use almost certainly use state funds to finance most of its energy expansion.

- *The dispute over the islands of Abu Musa and the Tunbs is one where the US should continue to back the UAE in seeking a peaceful legal resolution of the dispute, but make it clear it will not support any UAE use of force.* The strategic placement of the islands near the main shipping routes in the Gulf would also make it far better if they were not heavily militarized by Iran. At the same time, the legal nature of the dispute surrounding Abu Musa and the Tunbs is a historical nightmare of conflicting laws and precedents from a time of empires and colonial expansion. The US and Britain also tolerated the Shah's seizure of the islands in 1971, and are in a poor position to argue

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legalisms now. Accordingly, the US should make it clear to the UAE that it will not support any military adventures over the islands, and that a US commitment to aid in the defense of UAE territory and offshore holdings does not extend to the islands. The US does seem to have made this position clear at the diplomatic level. This is not yet fully understood within the UAE military.

- *The UAE is the worst remaining example in the Southern Gulf of a nation obsessed with buying arms for status and their glitter factor, rather than seeking to develop balanced and effective military forces where the value of the mission, readiness and training, and actual warfighting effectiveness are given priority*. These purchases have been of considerable benefit to the US in the case of the F-16 sale, and have had some value in creating a deterrent to Iran and building up the UAE's ability to support US power projection. Unlike most of its neighbors, the UAE can also afford a considerable amount of military waste. The fact remains, however, that the US needs a lasting strategic partner and not a customer.

- *The US should quietly encourage the UAE to limit its arms purchases and concentrate on "train and maintain" and real-world military effectiveness.* It should also encourage the UAE to resolve the tension with Oman that led to the dismissal of significant numbers of Omanis from the UAE military. The UAE cannot create effective forces with its own native manpower resources.

- *The UAE's critical strategic position in the lower Gulf makes it critical to its effective naval and air defense. The creation of a common air defense and maritime surveillance system with its neighbors, particularly Saudi Arabia and Oman, would greatly improve regional defense capability and the ability to accept US reinforcements. Similarly, the UAE will play a critical role in improving regional defense against mine warfare.* The US may or may not be able to encourage slow progress in GCC-wide military cooperation. This particular form of focused cooperation has much higher priority than overall generic improvements, although USCENTCOM has already found that it is anything but easy to achieve.

Bahrain

Bahrain is a small, strategically important island in the central Gulf. Its limited size and wealth make it a minor regional military power, and it has only very limited oil reserves. At present, it exports only 40,000 barrels per day, and receives its entire oil supply of 140,000 barrels per day from a field it shares with Saudi Arabia.[152] At the same time, its position in the upper Gulf off the coast of Saudi Arabia and near Kuwait, Iraq, and Iran gives it great value as a base and

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center for power projection into the upper Gulf. Bahrain has been a close ally of both the US and Saudi Arabia, and plays an important role in Gulf security.

Bahraini Internal Development and Stability

Bahrain has little oil left and its refinery operations are highly dependent on Saudi oil and Saudi Arabia's grant to Bahrain of its share of a jointly owned oil field. Bahrain is trying to create a post-oil economy. It has a large ship repair facility and aluminum plant, has invested in petroleum processing and refining, and has transformed itself into an international banking center. A number of multinational firms with business in the Gulf are headquartered in Bahrain. Its economy varies sharply according to the flow of oil revenues to other Gulf states and the prices for its petroleum exports, however, and petroleum production and processing still account for about 60% of export receipts, 60% of government revenues, and 30% of GDP. The depletion of its underground water resources adds to its serious long-term economic problems.[153]

Economic conditions have fluctuated with the changing fortunes of oil since 1985, for example, during and following the Gulf crisis of 1990-91. Bahrain was hit hard by the oil crash, and there is still high unemployment -- especially among young Shi'ites – in spite of high prices in 1999 and 2000. While its per capita income is still $13,700 in purchasing power parity terms, income is poorly distributed and much of it is concentrated in a small elite citizens have been squeezed out of the position in the middle class that they occupied a time of peak oil revenues.

Bahrain has suffered from deep divisions between its ruling Sunni elite and a largely Shi'ite population. The CIA estimates that the total population is 75% Shi'a Muslim 75% and 25% Sunni Muslim, but these figures are not based on a census, and most expert feel the portion of Shi'a is at least 80%. Poor labor and immigration policies -- and deliberate efforts to exploit low cost foreign labor even at the price of native unemployment -- have created a total population that is 63% Bahraini, 19% Asian, 10% other Arab and 8% Iranian.

Bahrain has been the target of serious Iranian political pressure in the past, although both the Shah and Khomeini renounced Iran's past claims to Bahrain. Iran probably did sponsor a coup

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attempt in the early 1980s, and has continued to back Shi'ite opposition groups, some of which have had extremist and violent elements. Other largely native Shi'a activist movements have been a key source of opposition since late 1994, however, and their demands have focused on return of an elected National Assembly and an end to unemployment.[154]

In recent years, Bahrain has often used Iran as an excuse for Shi'ite unrest that was provoked by its own failed economic policies and failure to grant Shi'ites a fair share of the nation's wealth and some share of political power. There are several small, clandestine leftist and Islamic fundamentalist groups that remain a source of danger, and some have ties to Iran. Most of the problem, however, is internal. Prime Minister Khalifa bin Salman Al Khalifa, who has served for many years, has exported blame when internal reform was needed. His intransigence and a failures to deal fairly with the Shi'ite problem, has been a significantly greater threat to Bahrain than Iran.

Fortunately, a new and younger Amir, Hamad bin Isa Al Khalifa, came to power in March of 1999. Both the new Amir, and his son and heir apparent Crown Prince Salman bin Hamad, have made important economic and political reforms, and have worked to improve relations with the Shi'a community. They understand the need to heal Bahrain's internal differences, and its economic priorities. Bahrain has a good planning staff, and has developed good development and economic reform plans in the past. The new Emir also promised a "new political era" in a speech on October 3, 2000, after he had appointed a new consultative council (Shura) with 19 new members out of 40. These include one Jew, an Indian-Bahraini, and four women. He also stated that elections for the Shura would be held for the first time in 2004.[155] The key issue is whether Bahrain can now act on these plans.

Bahrain's Military Capabilities

Bahrain has spent some $360 to $400 million on defense in recent years. It signed a total of $7.2 billion in new arms agreements between 1991 and 1999, all of which came from the US. It took delivery on $500 million during the same period, all of which also came from the US.[156]

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Bahrain has a total strength of only 11,000 actives. Its army has a strength of 8,500 actives, and has two active brigades – one armored and mechanized – although these are the equivalent of reinforce battalions by Western standards. It is largely US-equipped and has 106 M-60A3s and 220 M-113A2 armored personnel carriers (APCs). It has 120 additional APCs, and 51 armored infantry fighting vehicles, including 25 YPR-765s. It has 62 M-110 203-mm self-propelled artillery weapons and nine 227-mm multiple rocket launchers, plus an adequate number of towed artillery weapons and mortars. It is equipped with modern anti-tank guided weapons and adequate light anti-aircraft weapons. Bahrain's one I Hawk heavy surface-to-air missile battery is in its army.[157]

These land forces are reasonably well equipped and trained, but training is weak at the brigade level and in combined arms and joint operations. The potential saving grace is that both Iran and Iraq have only limited offensive sealift and have not practiced major combined arms amphibious landings with serious forced entry capability. It should also be noted that Bahrain has a total of 10,150 men in its paramilitary forces – more than in its army – and that Bahrain's overall military structure focuses as much on internal security as foreign threats.

The Bahraini Air Force has a total of 1,500 men and 34 combat aircraft and 26 armed helicopters. Its first line air strength now includes 22 F-16C/D fighters and 24AH-1E armed helicopters. It also has 12 F-5E/F fioghters and 10 armed AB-212 helicopters. This small force is well trained and is combat capable within the limits imposed by its size. It does not have modern maritime surveillance, airborne warning and air control aircraft, and airborne refueling capability, or a modern land-based air defense sensor and control network, but these are not practical for a small country.

The Bahraini Navy has some 1,000 men. It has one modern missile frigate with Harpoon anti-ship missiles, two missile corvettes with Exocet anti-ship missiles, and four missile patrol craft with Exocets. These ships are reasonably well manned, but training funds are limited. Like most Southern Gulf navies, the Bahraini has limited current mine, antisubmarine, and surface-to-

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surface missile warfare capability.. It can, however, perform a maritime surveillance and escort mission, and supplement US and British naval action.

Bahrain, the US, and Collective Security in the Southern Gulf

Bahrain's vulnerability and strategic location in the upper Gulf means it will always be vulnerable to pressure and threats from either Iran or Iraq. Bahrain has long recognized this, however, and has developed military relationship to the US and Saudi Arabia that provide it with a high degree of external security

Bahrain's strategic location also makes it an important partner for the US. It has excellent port and air basing facilities, and one of the most modern ship repair facilities in the region. It has long been a close ally of the US, and is now the host to the U.S. 5th Fleet. The history of Bahraini and US military cooperation provides an impressive picture of its strategic importance to US operations in the Gulf: [158]

- Bahrain has maintained close military relations with the US since Britain departed the Gulf. On December 31, 1971, the US and Bahrain signed a leasing agreement allowing the US to use 10 acres at Jufair to support its Middle East Force (MEF) in the Gulf -- this included US use of a transmitter and antennae, priority use of Berth 1 at the port, waterfront ship repair facilities, and land rights, and hangar and office space at Muharraq Airfield.[159]

- As a result of the tensions following the October War, Bahrain officially terminated this arrangement on October 20, 1973, but this termination had no practical effect, and Bahrain quietly reinstated the lease in July, 1975 -- expanding its scope on August 12, 1975, and June 30, 1977. The agreement of June 30, 1977, is typical of many aspects of the informal cooperation between the US and Gulf states before the Gulf War. Officially, the US Navy no longer homeported the MEF in Bahrain, but maintained a "temporary duty administrative unit." In practice, the US continued to "homeport" its Gulf naval forces (Middle East Force) in Manama and use the port facility at Mina Al-Sulman.[160]

- Bahrain provided extensive support, basing, and repair support to the US during "Operation Earnest Will" in the tanker war with Iran in 1987-1988. This US operation required extensive support from friendly Gulf states. The US used a total of 27 warships, which conducted 127 missions from July, 1987 to December, 1988. Bahrain played a critical role in helping the US recover the *USS Stark* after it hit a mine in the Gulf, and also supported the US during Operation Praying Mantis -- when the US attacked Iranian oil platforms in the Gulf.

- Bahrain furnished extensive naval and air facilities to the US and Britain during the Gulf War. In September, 1990, Bahrain accepted US F/A-18, A-6, EA-6 and AV-8B air units, and British Tornado units. Bahrain provided a 200-man infantry company to Joint Forces Command (East). Bahrain's air force was relatively new and just absorbed deliveries of F-16s. Nevertheless, the Bahrain Air Force flew a total

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of 266 combat sorties. It used its new F-16s to fly 166 defensive and offensive counter-air sorties, averaging 4-6 sorties per day. It used its F-5s to fly 122 interdiction sorties, averaging about 3-4 sorties per day. It attacked targets like radar sites, Silkworm sites, and artillery positions [161]

- Bahrain deployed a squadron of fighter aircraft to Kuwait when Iraqi forces moved towards the Kuwaiti border in October, 1994.[162]

- On October 22, 1991, Bahrain signed a ten-year bilateral agreement, expanding the US military presence in Bahrain. The agreement expanded US prepositioning in Bahrain, called for expanded joint exercises and training, allowed the US to set up a JTME (USCENTCOM headquarters), and increased US access to Bahraini ports and airfields. The US now has several warehouses of prepositioned equipment and supplies at Sheik Isa Air Base.

- On July 1, 1995, Bahrain agreed to allow the US to create the headquarters for its new 5th Fleet in Bahrain, with an Admiral and a headquarters contingent. This headquarters commands a force that now averages 15 vessels, including a carrier. There are now roughly 1,500 US military personnel based in Bahrain. The fleet is now officially based at Mina Sulman.

- In November, 1995, Bahrain agreed to allow the US to temporarily deploy 18 additional US combat aircraft in Bahrain to make up for the "gap" created by the need to withdraw a US carrier from the Gulf before a new one could be deployed.[163]

- Joint exercises between Bahraini and US forces have increased from two per year after the Gulf War to nearly eight.

- There is a US Office of Military Cooperation in Bahrain.

During 1992-1999, Bahrain signed $700 million worth of new US arms agreements out of a total of $700 million, and took delivery on $$500 million worth of actual deliveries out of a total of $500 million. [164] Most came as surplus US equipment and aid.

Implications for US Policy

In spite of Bahrain's small size and limited oil wealth, it is an important strategic partner in the Gulf. The US has already developed a solid strategic partnership with Bahrain, and its key priority is to maintain that partnership and consolidate it. This can best be done by continuing the level of close military cooperation it has already developed, but the US needs to improve its efforts to help Bahrain deal with its internal problems.

- *The US should act quietly, but strongly support the political and economic reforms the Amir is making and efforts to share power and the nation's wealth with the Shi'ite population. It should also strongly encourage Bahrain's efforts to reduce its dependence*

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on foreign labor. The principal security risk that Bahrain now faces is that the long-standing political tensions between its Sunni elite and Shi'ite majority could explode into open civil conflict, lead to Iranian covert or overt intervention, and/or bring down its royal family. The new Amir is making real progress, but the Prime Minister remains a political embarrassment and now all of Bahrain's elite seems to understand that change and reform are essential to its security.

- *The US should continue to make it clear, however, that it will oppose any such Iranian efforts to interfere in Bahrain's internal affairs and work closely with Bahrain and Saudi Arabia to monitor Iran's actions.* Bahrain has reestablished diplomatic relations with Iran, and there is little evidence that Iran has made aggressive attempts to support any form of Shi'ite unrest or violence in Bahrain since the Khatami government came to power.

- *The US should continue to avoid taking sides in this dispute and do everything possible to encourage Bahrain and Qatar to fully resolve them by relying on the ICJ.* Bahrain is making progress in reducing its long-standing tensions with Qatar. Its territorial dispute with Qatar over the Hawar Islands, and its maritime boundary dispute with Qatar are currently before the International Court of Justice (ICJ)

Oman

Oman's primary strategic importance lies in its control of the Str ait, the strategic position of the Omani enclave in the Musandam Peninsula opposite Iran, and its value in staging and prepositioning U.S. power projection forces. Oman has also been a critical staging point for US and British operations in the Gulf, and Britain continues to play a major economic role in Oman and serve as the key military advisor. The US has substantial amounts of military equipment prepositioned in Oman, and makes regular use of Omani ports and airfields. Oman could also provide ports on the Indian Ocean for pipelines for the rest of the Gulf.

Oman's oil and gas exports will, however, play a role in future global energy balances. Oman has proven oil reserves of 5.3 billion barrels, and natural gas reserves of 28.4 trillion cubic feet, but this scarcely makes it "oil rich' by the standards of its neighbors.[165] As a result, Oman's success in economic development is dependent on the success of its efforts to diversify and reform its economy.

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Oman, Development, and Internal Security

There have been important recent political reforms in Oman. Sultan Qabus issued a royal decree on November 6, 1996, that promulgated a new Basic Law. The Basic Law created a new structure for the country's political institutions, creating an upper legislative chamber, the Majlis al-Dawla (Council of State), alongside the Majlis al-Shura, for which elections were held in 1997 and 2000. The two chambers now form the Council of Oman. The upper chamber or Majlis ad-Dawla has 41 seats. The monarch appoints its members and it only has advisory powers. The lower chamber or Majlis ash-Shura has 82 seats. Its members are elected by limited suffrage, but the monarch makes final selections and can negate the results of the election. This body has some limited power to propose legislation, but otherwise only has advisory powers. The law also clarified the succession, provided for a prime minister, barred ministers from holding interests in companies doing business with the government, and guaranteed basic civil liberties for Omani citizens.[166]

Nevertheless, Omani political reform has not kept pace with the overall modernization of Omani society in recent years. At least some Omanis feel Sultan Qabus is less in touch with his people, and the nation’s wealth has become too concentrated in the hands of a relatively small elite. Sultan Qabus seems to have solved the succession problem that has grown out the fact he lacks an heir. He has given instructions for his family to consult on an heir rather than formally designated a specific person. This leaves some degree of remaining uncertainty.

An extremely high population growth rate and a declining real per capita income threaten Oman’s development program and stability in spite of major advances in overall national development. Oman’s population grew from around 800,000 in 1980 to 2.4 million in 1998. It is projected to grow to 3.3 million in 2015, and 4.2 million in 2030. It averaged 4.1% annual population growth during 1980-1998. [167] The growth rate remains at a very high 3.46%.[168] Oman also has failed to reduce its dependence on foreign labor at anything like the rate required to ensure employment and productive jobs for native labor. Its per capita income was a maximum of

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$8,000 in1999, even it purchasing power parity terms, and its national income was highly concentrated among a relatively small percentage of its population.

It is far too soon to predict any serious threat of political or economic instability, but Oman's current five-year plan calls for unrealistic levels of foreign investment, and future gas and oil production. There has been some salination of key agricultural areas, industrial development has been slow, and Omanization has not significantly reduced the number of foreign workers, many of whom are Indian, Pakistani, Sri Lankan, Bangladeshi and are not Muslims or part of Oman's dominant Ibadhi sect.

Oman's economy remains over-dependent on oil and gas exports. Oil revenues account for roughly 80% of the country's export earnings and 40% of gross domestic product (GDP). Oman encountered major funding and investment problems during the late 1990s, particularly during the "oil crash," and it had negative growth in 1998. Its economy is recovering, however, and real GDP growth was 2.5% for 1999 and is projected at well over 6.0% for 2000. Inflation is mild, projected at 2.0% for 2000.[169]

These pressures help explain why Oman has made privatization and diversification of its economy top policy priorities. The government is seeking to privatize of its utilities, and develop body of commercial law to facilitate foreign investment, and increased budgetary outlays. It is making an effort to liberalize its markets and accede to the World Trade Organization. [170] Oman has made major efforts to attract foreign investment, particularly in light industry, tourism and power generation. Incentives include a 5-year tax holiday for companies in certain industries, an income tax reduction for publicly held companies with at least 51% Omani ownership, and soft loans to finance new and existing projects. Oman pursuing membership in the World Trade Organization, and hopes to complete its accession negotiations by the end of 2000.

Oman and Energy

Most of the 5.28 billion barrels in proven oil reserves in Oman are located in the country's northern and central regions. Neither its reserves nor output will compare with those of the more

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oil-rich Gulf nations. The EIA estimates that the average well in Oman produces about one-tenth the volume per well compared to neighboring countries. Oman uses enhanced oil recovery (EOR) techniques to try to minimize the costs of exploration and further development at new and existing oil fields. Oman has succeeded in bringing down the cost of oil production to $3 per barrel in some fields and $4 per barrel in others - but these production costs are still substantially above most other Persian Gulf oil fields.[171]

Oman is not a member of OPEC or OAPEC (The Organization of Arab Petroleum Exporting Countries). Oman has cooperated with both however, and pledged production cuts of 63,000 barrels per day (bbl/d) from its production of 910,000 bbl/d in March 1999 in cooperation with OPEC's attempt to raise prices. Oman's next 5-year plan, which runs from 2001 through 2005, calls for an increase production to 1 million bbl/d.[172]

Oman has made natural gas -- both for export as well as for domestic gas-intensive industries -- the cornerstone of its diversification and economic growth strategy. Official projections call for gas to contribute about 15% of Oman's GDP by the year 2002. Through an extensive exploration program, Oman has consistently increased its natural gas reserves in recent years. The EIA estimates that Oman's estimated proved reserves were approximately 28 trillion cubic feet (Tcf) as of January 1, 2000, up from only 12.25 Tcf in 1992, mainly of associated gas.[173]

The expanded utilization of natural gas is central to Omani diversification plans, both for export as well as for domestic use. Gas projects include a LNG project in Sur, which began exports in April 2000, an aluminum smelter and petrochemical plant in Sohar, and a urea fertilizer plant in Sur. These projects can reduce Oman's dependence on oil and dependence on governmental spending and employment. [174]

Oman is also planning to extend its gas pipeline network. Two contracts have been awarded to separate firms for projects connecting gas deposits in central Oman to the coastal cities of Sohar in the north and Salalah in the south. Oman also is one of the intended destinations

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for natural gas from Qatar's North Dome field under the Dolphin Project. Initially, the project will link gas consumers in the United Arab Emirates with gas supplies from Qatar, but plans include the eventual construction of a line to Oman around 2005. If demand warrants, Oman could also serve as a transit corridor for gas exports from the Dolphin Project to Pakistan through a subsea pipeline.

Oman recently inaugurated its first LNG export venture, which shipped its first cargo to Korea in April 2000. The 6.6-million-ton-per-year liquefaction plant is located at Qalhat, near Sur. The LNG plant consists of two 3.3-million-ton-per-year LNG trains supplied by non-associated gas from the Saih Nihayda, Saih Rawl, and Barik gas fields. The second train became operational in May 2000, and Oman LNG will be selling on the spot market in 2000-2001.

Oman has signed a number of joint venture agreements to carry out exploration and development activities for future gas-based export projects. Oman also made an agreement with Iran in 1997 for the development of the Hengam/Bukha offshore field in the Strait of Hormuz, which straddles the line between the two countries' territorial waters. The field is currently producing 40 million cubic feet per day (Mmcf/d) of gas.

Oman and Gulf Security

Oman faces a number of security problems. Its most tangible foreign threat is Iran. Although Oman has made continuing efforts to improve its relations with Iran, and has had considerable success in dealing with Iran under both President Rafsanjani and President Khatami, it sizes and shapes its forces primarily to deal with the Iranian threat. Oman is fully aware of the Iranian build-up in the lower Gulf and the nature of Iranian proliferation. It is also aware that Iran may seek to seize control of the Strait of Hormuz in some future conflict, although the main shipping channels flow through the Omani side.

The Strait of Hormuz is the only shipping route in and out of the Gulf. It is the world's most important oil chokepoint. Even partial closure of the Strait of Hormuz would force tankers to use Red Sea ports and the use of longer alternate shipping routes at increased transportation

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costs, and there are no alternate routes that can meet anything approaching current export levels, much less the much higher production levels forecast by DOE. To put these projections in perspective, the DOE reference case implies that two to three times as many tankers will transit the Strait in 2020 than do today. This means that Oman will become steadily more important with time, especially since Oman also offers the only potential secure land route for pipelines from the Southern Gulf to ports on the Indian Ocean.

Oman also faces low-level threats in the form of to long-standing tensions with Saudi Arabia and Yemen. Oman and Saudi Arabia have formally demarcated their boundaries, but Omanis question whether Saudi Arabia has firmly given up all of its past claims to Omani territory. The UAE has expressed some fears that Oman might seize its eastern emirates, and Oman and Yemen have had border clashes in the past. None of these threats seem particularly important today, but the Gulf is a region where no problem ever has a final solution or is forgotten.

Omani Military Capabilities

Oman has spent some $1.6 to $1.75 billion on defense in recent years. It signed a total of $1.1 billion in new arms agreements between 1991 and 1999. None came from the US, $1.0 billion came from Europe, and $100 million from other countries. It took delivery on $1.4 billion worth of arms during the same period, $1.3 billion came from Europe, and $100 million from other countries.[175]

It has a total active force of some 43,500 men, plus 4,400 more in paramilitary forces – largely in the Tribal Home Guard of Firgat, Police Coast Guard, and Police Air Wing. The royal household has a separate 5,000 man mechanized brigade, and two special forces regiments with 1,000 more men. There is also a royal flight and a Royal Yacht Squadron.

Its army has a total strength of 25,000 actives – less the 6,500 men in the royal household forces -- and has headquarters for one armored and two infantry brigades. In practice, its combat units consist of regiments that are battalion sized by Western standards – two armored, one

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armored reconnaissance, eight infantry, and one infantry reconnaissance. It has relatively little heavy equipment. It has 79 M-60A1 and M-60A3 s, and 38 Challenger 2, main battle tanks. It has 183 armored personnel carriers (APCs), of which 160 are Piranhas. It has 78 armored infantry fighting vehicles, including 37 Scorpions and 41 VBLs. It has 24 G-6 self-propelled artillery weapons , plus 91 towed artillery weapons and 89 mortars. It is equipped with modern anti-tank guided weapons and light anti-aircraft weapons.[176]

Oman's land forces have a good reputation as fighting men, but are under-equipped, and lack the ability to project power and fight armored maneuver warfare. They are neither equipped nor trained for modern combined arms and joint operations, and have limited logistic equipment and sustainment capability. Much of Oman's terrain is good for defensive infantry warfare, however, and Iran has only limited offensive sealift and has never practiced major combined arms amphibious landings with serious forced entry capability. As a result, Oman's main problems would be in dealing with a surprise Iranian attack on its Musandam Peninsula at the Strait of Hormuz. Even then, Iran would have to conduct an amphibious attack that would be vulnerable to aerial interdiction.

The Omani Air Force has a total of 4,100 men, some 40 combat aircraft, no armed helicopters, and no heavy surface-to-air missile batteries. It is a good force within the constraints imposed by its size and equipment, but its first line air strength now includes 12 modernized Jaguar fighters. It lacks advanced aircraft and adequate aircraft numbers. It has no modern maritime surveillance, airborne warning and air control system (AWACS) and airborne refueling aircraft, and lacks a modern land-based air defense sensor and control network.

The Omani Navy has some 41200 men. It has two corvettes with Exocet anti-ship missiles, four modern missile craft with Exocet, plus seven patrol craft. It has one LST plus 5 landing craft. The Omani navy has a good reputation, but it is equipment limited. It has little current mine, antisubmarine, and surface-to-surface missile warfare capability. It can, however,

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perform a maritime surveillance and escort mission in the Strait and Gulf of Oman, and supplement US and British naval action.

Oman, the US, and Collective Security in the Southern Gulf

Oman was the first Gulf nation to establish an embassy in the US, and the US and Oman have cooperated in the defense of the region since the Dhofar rebellion. Oman gave the US critical support in its effort to rescue the US Embassy hostages in Iran, during the "tanker war" with Iran in 1987-1988, and during the Gulf War: [177]

- The US has cooperated with Oman since the time of the Dhofar Rebellion and the US provided informal assistance to Oman, Britain, and Iran during their campaigns against the Dhofar rebels. The US supported Oman in its long confrontation with the PDRY, and in dealing with the potential threat posed by Iran after the beginning of the Iran-Iraq War. Oman has long permitted USCENTCOM to conduct exercises in Oman, and US Navy ships to use Omani facilities. Oman has provided data on tanker and other ship transits of the Straits of Hormuz to the US and UK from its base on Goat Island since the early 1980s.

- Oman and the US signed a military access agreement in July, 1981, which provided US access to building cantonments, hardened shelters, warehouses, and other facilities at Seeb, Masirah, Khasab, and Thumrait air bases, and ports at Muscat and Salalah, in return for $320 million in US funds to build-up these facilities.[178] The US provided over $199.1 million in FMS credits to Oman between FY1980 and FY1990, and about $853,000 in IMET assistance. During FY1981-FY1985, the US provided support to Oman for the construction of four air bases at Masirah, Seeb, Khasab, and Thumrait that could be used by US air units in rapid deployment to the Gulf.

- This construction included facilities for rear-area staging and forward deployment, and included improved operations, personnel, storage, and maintenance facilities. The US Navy developed an aircraft maintenance facility, ground support equipment shop, warehouse facility, and ammunition storage facility. The US Army created a staging base at Masirah to support the forward deployment of US Army forces. The US helped provide hardened shelters, dispersal and access pavements, environmentally controlled warehouses, transient billeting, and cantonment support areas at Seeb and Thumrait. The US access agreement is reviewed every five years, and the latest review was due in 1995.

- Oman allowed the US and Britain to use Oman as a staging base and to deploy reconnaissance aircraft during the tanker war, and Gulf Wars, and allowed the US to stage reconnaissance and air-control flights out of Oman during Operation Praying Mantis -- when the US attacked Iranian oil platforms in the Gulf. Oman provided about 950 troops to the Arab Joint Forces Command (East) during the Gulf War.

- Oman has regularly renewed its 1981 access agreement with the US. Oman deployed a squadron of fighter aircraft to Kuwait when Iraqi forces moved towards the Kuwaiti border in October, 1994.[179]

- The US maintains an Office of Military Cooperation in Oman.

- Oman works closely with Britain, and British soldiers help train the Omani Army. There are British officers and NCOs seconded to the Omani Navy, and some 80 British officers seconded to the Omani air

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force. British SAS personnel have trained the Omani anti-terrorist force and assist in surveillance of the border with Yemen. France provides a limited amount of training for Omani officers.

Oman has consistently given the US close support since the Gulf War, and sees its alliance with the US as a critical deterrent to attack from Iran and political pressure from Southern Gulf states like Saudi Arabia. It has received little US aid for this support, although Oman is a relatively poor country by Southern Gulf standards. It has only been able to afford a limited degree of force modernization and has relied largely on Britain for its military equipment. During 1992-1999, Oman signed less than $50 million worth of new US arms agreements out of a total of $1.1 billion, and took delivery on less than $50 million worth of actual deliveries out of a total of $1.4 billion. [180]

Implications for US Policy

Oman is an important strategic partner in the Gulf,. The US has long had good military relations with Oman and has supported its development efforts. The challenge is to build upon success and there are several areas where the US could strengthen its alliance.

- *Respect and courtesy are part of successful policy.* The US has tended to ignore Oman's political sensitivities, and show sufficient gratitude for Sultan Qabus's and the Omani government's support. This failure has occurred at the Washington level and not in diplomacy or in USCENTCOM's efforts

- *Oman is not a major energy power. Its ports are, however, a potential way to bypass the Strait of Hormuz in shipping oil and gas from the rest of the Gulf. The GCC examined such pipeline options in the past, and they need reexamination as part of any broad effort to reduce the vulnerability of energy facilities in the Gulf.*

- *The US should strengthen its dialogue with Oman over economic development*. This is not simply a matter of encouraging US investment. Like a number of other Gulf states, Oman's plans tend to overreach, reforms are slowly executed, and efforts to attract foreign investment are blocked by a number of regulatory, tax, and procedural barriers. The problem is not that the US has not tried to help, it is that it could raise the level of dialogue, strengthen the embassy team to help, and give the activity higher priority in Washington. Development and reform are the key to Omani internal security.

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- *Once again, the US needs to quietly push a Gulf ally towards some form of population management policy, as well as better plans to reduce its dependence on foreign labor and create more jobs for native youth.*

- *Oman, like Bahrain, is one of the few Gulf states that needs more effective US military aid.* Even limited amounts of US aid could help, and so could more effective efforts to transfer surplus US military equipment and to subsidize the costs of making such transfers.

- *Encouraging, rather than discouraging, Oman in maintaining and expanding its dialogue with Iran is in the US national interests.* As is the case with Saudi Arabia, Oman's dialogue with Iran has helped to reduce tensions in the Gulf and strengthen the forces that are leading Iran towards moderation. This is recognized by many US officials, but goes against the spirit of US law. Oman is the one nation in the Gulf where Britain maintains a significant presence, and has major economic and trading interests. The US needs to be more sensitive to these interests, and the degree to which they help ensure the continued British presence in the Gulf.

Qatar

Qatar is a small nation that occupies a peninsula in a strategic location in the middle of the Southern Gulf. It is a small to medium-sized energy exporter, but future importance because of its ability to exploit its massive gas resources. Qatar is one of the founders of the Gulf Cooperation Council (GCC), and Qatari troops fought on the side of the UN Coalition during the Gulf War. The Qatari forces at the battle of Ras al Khafji were among the first Coalition troops to engage Iraqi ground forces. Since the Gulf War, Qatar has steadily expanded its strategic ties to the West and the United States. It is providing prepositioning facilities for a U.S. Army brigade and the support equipment for a division base, and it conducts regular exercises with British, French, and U.S. forces.

The present Amir, Sheik Hamad bin Khalifa Al Thani, assumed power in June, 1995 as the result of a bloodless coup that ousted his father, the former Amir Khalifa bin Hamad Al Thani. This bloodless coup is the kind of "family coup" that has occurred several times in Qatar since the Al Thani family first took power. Hamad survived a low-level counter-coup attempt by his father, and he seems reasonably secure although his health is uncertain. There are no current signs that

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there would be any radical changes in Qatar's policies, even if a new Amir did emerge from within the royal family.

Qatar has modernized steadily since 1995, when Sheik Hamad bin Khalifa al-Thani, took power and is becoming one the most liberal Gulf states. Sheik Hamad has allowed limited political liberalization, including the creation of an elected council and allowing women the right to vote. The Qatari media, including its large TV broadcast station, are some of the most liberal in the Gulf.

The Qatari Economy: Betting on Gas

Qatar retains considerable per capita oil and gas wealth, although Qatar's total native and expatriate population grew from around 200,000 in 1980 to 700,000 in 1998.[181] Its current per capita GDP is well over $17,000, and is equal to three-fourths that of the leading West European industrial countries, Oil continues to dominate Qatar's economy, although natural gas is becoming more important. Oil accounted for 30% of the GDP, roughly 80% of export earnings, and 66-70% of Qatar's government revenues in 1999, and also has an impact on production of condensate and associated natural gas. [182]

Qatar has had budgeting problems in recent years to pay for a huge liquefied natural gas (LNG) development program (Qatar has the third largest gas reserves in the world, after Russia and Iran). Qatar has had to maintain relatively tight fiscal and monetary policies, because of the burden its massive investments in gas production have placed on its economy. Qatar is now servicing a debt that increased from under $5 billion to over $10 billion between 1994 and 1996, and reached nearly $12 billion by 1999. Qatar accumulated this debt largely for infrastructure investment in oil and gas projects, which sharply increased Qatar's oil production capacity, construction of facilities for the export of LNG, and petrochemical plants.[183]

Qatar did not receive an expected increase in export revenues in late 1997-1998, because of low crude oil prices, and the Asian financial crisis. This placed a strain on Qatar's economy

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which had already suffered because the Amir's deposed father had initially kept control over much of the nation's capital, which was kept in his overseas accounts.

The recovery in Asia and oil prices in 1999-2000, and the start of gas deliveries from the RasGas LNG project substantially eased Qatar's debt burden and its real gross domestic product (GDP) grew at an annual rate of 3.3% in 1999, after posting growth of only 0.3% in 1998. Qatar's oil export earnings for 2000 currently are forecast at $6.6 billion, up 61% from 1999 and more than double the $2.9 billion which Qatar earned from oil exports in 1998.[184]

Qatar recorded a budget surplus for the 1999/2000 fiscal year, which ended in March 2000. This was the first budget surplus in several years, and the CIA estimates that, Qatar will post its highest ever trade surplus in 2000 - of more than $4 billion. The estimated rate of real growth in GDP for 2000 is well over 5%, and growth is projected to be at least around 5% after 2000, because of the rise in the production and sale of natural gas.[185] Qatar has also accelerated its gas development plans. Qatar's Ras Laffan Natural Gas Company announced plans on October 2, 2000 to double its LNG capacity by 2005. It plans to add two gas trains to its current facilities at a cost of over $2 billion. This would add about 8 million tons of capacity to Qatar's two existing trains, which has a total capacity of 6.4 million tons, and create a total capacity of 14.9 million tons by 2005.[186]

Qatar and Energy

Qatar is still a significant oil exporter, although its reserves are limited compared to those of many of its Gulf neighbors. The US estimates that Qatar has proven oil reserves of 3.3-4.3 billion barrels (0.4% of the world's total). BP Amoco estimates reserves of 3.7 billion barrels. [187] About 2.2 billion barrels are located in the Dukhan field, Qatar's only onshore field. The remaining proven 1.5 billion barrels are held in six offshore fields Bul Hanine, Maydan Mahzam, Id al-Shargi North Dome, al-Shaheen, al-Rayyan, and al-Khalij. In 1999, Qatar's net oil exports totaled 760,000 barrels per day (bbl/d), The U.S. Department of Energy estimates that Qatar's oil

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production capacity will increase slowly from 0.6 million barrels per day in 1998, to 0.7 million barrels per day in 2020.[188]

As has been touched upon earlier, Qatar does, however, have massive gas reserves and is gradually becoming a major gas power. According to U.S. estimates, Qatar has total producible gas reserves of approximately 237 trillion cubic feet, or 40 billion barrels of oil equivalent; this is about 5% of the entire world's gas reserves. BP Amoco estimates that Qatar has 300 trillion cubic feet of gas, or 5.8% of the world total. [189] Both sources agree that Qatar is the third largest nation in the world in terms of total gas reserves. Qatari sources make much more ambitious claims and estimate that Qatar has reserves approaching 380 trillion cubic feet.[190]

Most of Qatar's gas is located in the North Dome Field in the Gulf which contains 380 Tcf of in-place and 239 Tcf of recoverable reserves, making it the largest known non-associated gas field in the world. This field is part of a structure that extends into Iranian waters. Its Dukhan field contains another estimated 5 Tcf of associated and 0.5 Tcf of non-associated gas, and there are smaller associated gas reserves. [191]

Qatar now has two liquefied natural gas (LNG) exporters: Qatar LNG Company (Qatargas); and Ras Laffan LNG Company (Rasgas). Qatargas venture delivered its first shipment of LNG to Japan in December 1996, and its plant now consists of three, 2-million-ton-per-year (Mmt/y) (97 billion cubic feet - Bcf) trains. Qatargas has plans to add a fourth train by 2002. Rasgas has two 2.5-Mmt/y (122 Bcf) trains. The first train was completed in early 1999, and second train came onstream in April 2000. A tender for a planned third and fourth trains is planned for late 2000.

An Enhanced Gas Utilization (EGU) project will develop upstream infrastructure in a portion of the North Field for domestic use, export to neighboring Gulf states, and use as a feedstock for petrochemical projects. The initial phase of the project will produce 500 million cubic feet per day (Mmcfd), with eventual capacity slated to rise to 1.75 Bcf/d. The Dolphin Project to create an integrated gas pipeline grid for Qatar, UAE, and Oman, has been discussed

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earlier, and the total project is expected to cost $10 billion. Kuwait also has held discussions with Qatar about the purchase of Qatari gas. [192]

Qatar and Gulf Security

Qatar faces a potential challenge from Iran because its massive North Dome Field has gas reserves that cross into Iranian waters. Qatar currently has good relations with Iran. Qatar has tried to balance its relations with Iran by showing sympathy for Iraq's positions on sanctions. The main threat to Qatar's position would be if Iran should dispute Qatar's claims to any part of its North Dome Field, or take advantage of the high vulnerability of Qatar's gas facilities.

Qatar also has a tendency to feud with its Southern Gulf neighbors and other moderate Arab states. The Foreign Affairs Minister, Sheik Hamad bin Jassem bin Jabr Al-Thani, has sometimes seemed to delight in such feuds. He has picked them with Bahrain, Egypt, Saudi Arabia, and the UAE – although these feuds have large died down in recent years.

Qatari Military Capabilities

Qatar has spent some $1.2 to $1.4 billion on defense in recent years, roughly the same as Oman. It signed a total of $2.0 billion in new arms agreements between 1991 and 1999, all of which came from Europe. It took delivery on $3.1 billion worth of arms during the same period, all of which also came from Europe.[193]

Qatar has a total active force of some 12,330 men, plus a mobilizable national guard. Its army has a total strength of 8,500 actives. It's a royal guard regiment, a special forces company-sized unit, a tank battalion, and four infantry battalion. It has little heavy equipment. It has 44 obsolete AMX-30 tanks, 172 armored personnel carriers (APCs) and 112 armored infantry fighting vehicles. It has 28 F-3 self-propelled artillery weapons, plus four ASTROS II multiple rocket launchers, 12 G-5 towed artillery weapons and some mortars. It is equipped with modern anti-tank guided weapons and light anti-aircraft weapons.[194]

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This is a small force. Although some Qatar troops fought well in the Gulf War, it is simply too small to do more than screen the border and coasts. Its advantage would be that neither Iran or Iraq have ever practiced major combined arms amphibious landings with serious forced entry capability, and would have to conduct an amphibious attack that would be vulnerable to air and naval interdiction.

The Qatari Air Force has a total of 1,500 men, some 18 combat aircraft, 19 armed helicopters, and no heavy surface-to-air missile batteries. It is an adequate force within the constraints imposed by its size and equipment, but its first line air strength now includes only 12 Mirage 2000 fighters, 11 SA-342L helicopters with HOT anti-tank missiles, and 8 Commando helicopters with Exocets. It lacks advanced aircraft and adequate aircraft numbers. It has no modern maritime surveillance, airborne warning and air control system (AWACS) and airborne refueling aircraft, and lacks a modern land-based air defense sensor and control network.

The Qatari Navy has some 1,730 men. It has seven modern missile craft with Exocet ASMs, plus four inshore patrol craft, and several shored-based Exocet batteries. It has little current mine, antisubmarine, and surface-to-surface missile warfare capability. It can, however, perform a maritime surveillance mission, and supplement US and British naval action.

Qatar, the US, and Collective Security in the Southern Gulf

Qatar is too small to be a significant military power. Like Bahrain, however, its port and air facilities are of great strategic value in naval and air operations against either Iraq or Iran. Qatar and the US did not cooperate closely in military terms until the Gulf War. Qatar did, fight well in the Gulf War, and Qatar has now become an important base for US prepositioning and could provide important basing facilities: [195]

- Qatar permitted US air units to stage out of Qatar during the Gulf War. Qatar provided a 1,600-man mechanized battalion with 25 tanks, 60 other armored vehicles, and 3-5 artillery weapons. This force fought well at the Battle of Khafji, and in Joint Forces Command (East). Qatar also committed 700 men, 21 fighters, and 12 armed helicopters from its small air force. Qatari Mirage F-1s flew 41 interdiction sorties, with a maximum of about 5 sorties per day. Qatari Alphajets flew two sorties. The Qatari Air Force was forced to cancel or abort 22 sorties, but 16 of these cancellations were due to weather.[196]

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- On June 22, 1992, Qatar negotiated a bilateral security arrangement with the US that offers the US access to Qatari air and naval facilities. Since that time Qatar has conducted an increasing number of exercises with US forces.

- In March, 1995, Qatar formally agreed to the prepositioning of the heavy equipment for one US Army mechanized brigade in Qatar -- including up to 110 US M-1A2 tanks. Warehouses are now under construction in Doha to preposition US equipment The Qatari air force has also begun to conduct combined air exercises with the US, and may acquire a site in Qatar.[197]

- Qatari forces are largely French-equipped and only have limited interoperability and sustainability with US forces. Qatar only purchased $1.9 million worth of US Foreign Military Sales (FMS) between FY1950 and FY1990, and took delivery on $1.9 million worth.[198] A US Military Liaison Office opened in Doha in 1991. Since the Gulf War, Qatar has purchased $2.7 million worth of US Foreign Military Sales (FMS), and taken delivery on $1.4 million worth.[199]

There has been substantial US and Qatari cooperation in training and exercises, but there is little direct interoperability in terms of Qatari reliance on US weapons. During 1992-1999, Bahrain signed less than $50 million worth of new US arms agreements out of a total of $2.8 billion, and took no significant deliveries of US arms out of a total of $3.1 billion. [200]

Implications for US Policy

Qatar is a small nation that occupies a peninsula in a strategic location in the middle of the Southern Gulf. It is a relatively small oil and gas exporter, but has considerable future importance in world energy supplies because of its ability to exploit its massive gas resources. Since the Gulf War, Qatar has steadily expanded its strategic ties to the West and the United States. It is providing prepositioning facilities for a U.S. Army brigade and the support equipment for a division base, and it conducts regular exercises with British, French, and U.S. forces.

Qatar's economy now seems relatively strong, and Qatar's small military forces cannot be expanded beyond tight limits. The US has maintained good relations with Qatar since the Gulf War, but there are some areas where existing policy can be improved or reinforced.

- *As is the case with Oman, the US needs to be more sensitive to Qatar's political sensitivities.* This failure has occurred at the Washington level and not in diplomacy or in USCENTCOM's efforts.

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- *The US needs to monitor the success of Qatar's oil and gas development and help to ensure suitable investment is available.* Market forces should be adequate to provide the necessary investment, but some US official encouragement could prove necessary.

- *Qatar offers the best option outside Saudi Arabia for US Army prepositioning.* Current plans need to be reexamined to look at ways to provide more firepower, and less emphasis on the standard US army unit equipment set.

- *Qatar needs focused military modernization*. The US is not a major supplier to Qatar, but it can encourage Qatar to make improvements in the right mission areas. Mine warfare and playing a role in integrated air defense and maritime surveillance systems

- *Qatar's political liberalization is already impressive and being encouraged by the US. This should continue.*

- *While it is an extremely delicate issue, Qatar's past tendency to pick petty quarrels with neighboring states has not helped regional cooperation. There are severe limits to what US diplomacy can do to persuade Qatar not to repeat these problems in the future,, but the US should do what it can.*

Yemen

Yemen is not geographically a Southern Gulf state, and is not a major energy power. It does have a strategic location at the entrance to the Red Sea, however, and can have a significant impact on the security of Oman and Saudi Arabia. In also has a dismal history of political violence and civil war. It is formed out of the Yemeni Arab Republic, or North Yemen, -- which had a long history of low level tension and internal violence -- and a far more violent People's Democratic Yemeni Republic, or South Yemen, which sponsored the Dhofar rebellion against Oman and whose pseudo-Marxist political character scarcely concealed the most vicious internal power struggles in the modern Arab world.[201]

Yemen was united in May 1990, when a civil war in South Yemen crippled the nation to the point where a new regime emerged that signed a unification agreement with North Yemen that created a united Republic of Yemen. Political battles between the new President Ali Abdallah Saleh, from North Yemen, and Vice President Ali Salim al-Baidh, from South Yemen, then led to

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armed clashes between north and south forces in April 1994. This escalated into civil war by May 1994. The war ended after the fall of Aden, the former capital of South Yemen in July 1994.

President Ali Abdallah Saleh now seems to have a relatively firm group on power – to the extent political stability is possible in Yemen -- and there is a slow movement towards political liberalization and economic reform. There are, however, continuing tribal disputes, political tensions between north and south, and periodic kidnappings. The attack on the USS Cole in October 2000 has also shown that Yemen remains a major base for terrorist or extremist action. Peace and stability in Yemen remain unbcertain.

Economics and Internal Stress

Yemen is an extremely poor country. The US State Department estimates that over 40 percent of its population lives in poverty. Its embryonic market-based economy faces excessive government interference and endemic corruption despite a major economic reform program, Its annual per capita gross national product (GNP) fell from $325 in 1997 to $260 in 1998, although it rose to $275 in 1999.[202]

Agriculture accounts for approximately 22 percent of GNP, industry for approximately 27 percent, and services for approximately 51 percent. Oil provides the primary source of foreign exchange. Other exports include fish, agricultural products, cotton, and coffee. Remittances from citizens working abroad (primarily in Saudi Arabia) are also important. Remittances were reduced sharply in 1990, however, after Saudi Arabia and other Gulf States expelled up to 850,000 Yemeni workers during the Gulf War because of the Government's lack of support for the U.N. coalition. The Gulf states also suspended most assistance programs, and most Western aid was reduced, although foreign aid has gradually been restored.[203]

Yemen is an economic and demographic nightmare in terms of absolute increases in population numbers:[204] Yemen’s population grew from 8.5 million in 1980 to 16.6 million in 1998. It is projected to grow to 26.6 million in 2015, and 36 million in 2030. It averaged 3.7% annual population growth during 1980-1998. [205] At present, some 47% of the population is 14

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years of age or younger, and the growth rate is still a high 3.36%. The average annual per capita income is only $750, and the national income is largely controlled by a relatively small elite.[206]

Years of civil war, military adventures, and misgovernment have combined to leave the current government with a heritage of limited economic development; a failed, drug-dominated agricultural sector; and heavy dependence on limited oil revenues and income from expatriate workers. High population growth approaching an annual rate of 4% has made the situation far worse.

The impact of Yemen's efforts to reduce subsidies under an IMF reform package have also created political problems. Reduced subsidies on oil and electricity doubled fuel prices in March 1995, and led to violent protests, especially South Yemen. Further increases in prices for fuel, electricity water and diesel fuel prices led farmers to block the main Sanaa-Aden highway in 1996, and similar unrest took place with new price rises in 1997 and 1998.

Yemen does seem to be making a real effort to achieve economic reform, however, and to follow the guidance of the IMF and World Bank. The government is trying to encourage private investment in the agriculture, fisheries, oil, and tourism sectors, and privatize state companies. State-owned businesses cited as candidates for privatization include farm and agricultural cooperatives, construction companies, power stations, public housing facilities, refineries, the state's petroleum retail network, shipping companies, and the state telecommunications company. It is also seeking to encourage foreign and private domestic investment.

So far, investment in Yemen is only marginally attractive except in the energy sector, and even now there are problems with kidnapping and banditry. Yemen's real gross domestic product (GDP) growth may still not exceed its population growth rate in 2000, in spite of very high prices, and the fact that oil sales account for approximately 40% of Yemen's total government revenues and is the country's main source of foreign currency.

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Energy

The EIA estimates that Yemen contains proven oil reserves of 4 billion barrels, and proven recoverable reserves of 1.7 billion barrels. Yemen's oil output average only 409,000 barrels per day (bbl/d) in 1999, although it provided the country's main source of income. Production is expected to climb to increase to 500,000 bbl/d by the end of 2000. Civil war has limited Yemen's energy development. Exploration and investments declined in 1994, because of the civil war but also because of non-competitive unattractive exploration and production contract conditions, and a low success rate of new discoveries. Exploration activity did increase after 1997 when the civil was over and Yemen offered more attractive contract terms. It is unlikely, however, that Yemen will approach one million barrels a day unless it makes major new discoveries.

Yemen has natural gas reserves of 16.9 trillion cubic feet (Tcf), and some potential as a natural gas producer and exporter. France's TotalFina and Yemen's General Gas Corporation set up Yemen Liquefied Natural Gas Company in early 1996, to operate a $5-billion LNG project. It is now Yemen's largest single energy project, and will develop Yemeni natural gas fields, and transport gas via pipeline to a natural gas processing plant and export terminal in Bal Haf on the coast of southern Yemen. The LNG would supply a planned LNG terminal in Bombay, India. The Yemeni LNG plant is to projected to have an export capacity of 0.26 Tcf per year. The project was originally supposed to begin production 2000 or 2001, but weak demand because to the Asian economic crisis delayed the start of the project. The planned completion date is now 2003.

Yemen and Gulf Security

Yemen does not play a major role in Gulf security, but --as has been discussed earlier-- major internal unrest could trigger a threat to Oman of Yemen. The former People's Democratic Republic of Yemen was a key sponsor of the Dhofar rebellion in southern Oman in the 1960s, and the Yemeni Arab Republic has repeatedly clashed with Saudi Arabia over a border dispute that has lasted for more than 60 years. The new Republic of Yemen and Saudi Arabia agreed to settle their common border in September 2000, but there have been past agreements that failed and led

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to new fighting along their 1,300-mile frontier. Yemen has also been involved in disputes over islands in the Red Sea also is in dispute.

Yemen is not a major military threat to its Gulf neighbors. Civil wars have destroyed much of its military equipment and it has had few recent arms imports. It can only afford to spend $370-400 million a year on armed forces. It signed a total of $900 million in new arms agreements between 1991 and 1999. Some $700 million came from Europe, and $100 million from other countries. It took delivery on $300 million worth of arms during the same period, of which $200 million came from Europe, and $100 million from China.[207]

Its active military forces now total 66,300 men. Its army has 61,000 men, with a claimed total of nine armored brigades, 18 infantry brigades, and one special forces brigade, but these units are normally little more than large battalions. It has some 990 main battle tanks, but virtually all are obsolescent FSU-supplied models. Only 30 are T-72s and its 60 M-60A1s are now aging. Most of its armored infantry fighting vehicles and personnel carriers are also aging and of low quality, although it does have some 200 BMP-1/2s. Its artillery is largely towed, with 412 towed weapons, 30 obsolete SU-100 assault guns, and roughly 200 FSU-supplied 122-mm and 140-mm multiple rocket launchers. It has large numbers of low quality anti-tank weapons and antiaircraft systems. It also has 12 FROG-7, 12 SS-21, and 6 Scud-B surface-to-surface missiles.[208]

The 3,500-man Yemeni air force consists of 49 active combat aircraft, and 40 in storage, plus eight Mi-35 attack helicopters. Its only modern aircraft consist of five MiG-29s and 17 Su-20/22s. It has SA-2, SA-3, and SA-6 surface-to-air missiles, but they have limited operational capability.

Yemen's 1,800 man navy has for missile patrol boats, three of which are relatively modern Chinese-supplied vessels, but which are equipped with only 4 C-801s for all three craft. It also has two aging Russia missile patrol boats, equipped with Styx, of which only one is operational. Its other holdings include eight inshore patrol boats, six aging mine vessels, and one LST, 2 LCMs, and some small landing craft.

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Given these forces, Yemen would require a major military build up to challenge Saudi Arabia or Yemen and some source of outside supply of modern weapons. It would also require major improvements in organization, training, sustainment capability, C^4I/battle management systems, and virtually every other aspect of military readiness. Yemen has fought many civil and internal security battles, but its experience lies largely in infantry combat and artillery warfare and it does not have modern forces or effective war fighting capability.

Yemen would present a threat, however, if it launched a prolonged low intensity border war against either Saudi Arabia or Oman, or if it could exploit internal unrest in either of its neighbors. Both Saudi Arabia or Oman continue to see Yemen as a continuing threat, and one that requires significant contingency planning. Yemen is also a potential base for extremism and terrorism. The US State Department report on terrorism recognized this long before the attack on the USS Cole.[209]

> Yemen expanded security cooperation with other Arab countries in 1999 and signed a number of international antiterrorist conventions. The government introduced incremental measures to better control its borders, territory, and travel documents and initiated specialized training for a newly established counterterrorist unit within the Ministry of Interior. Nonetheless, lax and inefficient enforcement of security procedures and the government's inability to exercise authority over remote areas of the country continued to make the country a safehaven for terrorist groups. HAMAS and the PIJ had official representatives in Yemen, and sympathizers or members of other international terrorist groups—including the Egyptian Islamic Jihad, al-Gama'at al-Islamiyya, Libyan opposition groups, and the Algerian Armed Islamic Group—also resided in the country.
>
> Yemeni courts convicted the four surviving terrorists involved in the kidnapping in December 1998 of Western tourists in Mudiyah following a lengthy trial and appeals process. The 16 Western tourists held captive in that incident included two US citizens. Four of the tourists died, and two others—including one US citizen—were wounded during a Yemeni Government rescue attempt that liberated the remaining hostages. The leader of the Islamic Army of Aden, Zein al-Abidine al-Midhar, admitted to all charges against him in the incident and was executed by firing squad on 17 October. The three other defendants each received 20-year prison sentences. In a separate case, a Yemeni court in August convicted 10 terrorists—eight Britons and two Algerians—of conspiring to commit terrorist acts, including attacks targeting US citizens.
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Yemen is also reported to be the base of the operations of a cousin of Usama bin Laden, whose al-Qaida movement is the best-organized umbrella coup that can threaten the US with terrorist and extremist attacks in the Gulf.[210]

The bombings of the U.S. Embassies in Nairobi, Kenya, and in Dar es Salaam, Tanzania, on 7 August 1998 underscored the global reach of Usama Bin Ladin—a longtime sponsor and financier of extremist causes—and brought to full public awareness his transition from sponsor to terrorist. A series of public threats to drive the United States and its allies out of Muslim countries foreshadowed the attacks, including what was presented as a fatwa (Muslim legal opinion) published on 23 February 1998 by Bin Ladin and allied groups under the name "World Islamic Front for Jihad Against the Jews and Crusaders." The statement asserted it was a religious duty for all Muslims to wage war on US citizens, military and civilian, anywhere in the world.

The 17th son of Saudi construction magnate Muhammad Bin Ladin, Usama joined the Afghan resistance almost immediately after the Soviet invasion in December 1979. He played a significant role in financing, recruiting, transporting, and training Arab nationals who volunteered to fight in Afghanistan. During the

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war, Bin Ladin founded al-Qaida (the Base) to serve as an operational hub for like-minded extremists. The Saudi Government revoked his citizenship in 1994, and his family officially disowned him. He moved to Sudan in 1991, but international pressure on Khartoum forced him to move to Afghanistan in 1996.

Bin Ladin has stated publicly that terrorism is a tool to achieve the group's goal of bringing Islamic rule to Muslim lands and "cleanse" them of Western influence and corruption. To this end, Bin Ladin in 1999 led a broad-based, versatile organization. Suspects named in the wake of the Embassy bombings—Egyptians, one Comoran, one Palestinian, one Saudi, and U.S. citizens—reflect the range of al-Qaida operatives. The diverse groups under his umbrella afford Bin Ladin resources beyond those of the people directly loyal to him. With his own inherited wealth, business interests, contributions from sympathizers in various countries, and support from close allies like the Egyptian and South Asian groups that signed his fatwa, he funds, trains, and offers logistic help to extremists not directly affiliated with his organization. He seeks to aid those who support his primary goals—driving US forces from the Arabian Peninsula, removing the Saudi ruling family from power, and "liberating Palestine"—or his secondary goals of removing Western military forces and overthrowing what he calls corrupt, Western-oriented governments in predominantly Muslim countries. His organization has sent trainers throughout Afghanistan as well as to Tajikistan, Bosnia, Chechnya, Somalia, Sudan, and Yemen and has trained fighters from numerous other countries, including the Philippines, Egypt, Libya, Pakistan, and Eritrea.

Using the ties al-Qaida has developed, Bin Ladin believes he can call upon individuals and groups virtually worldwide to conduct terrorist attacks. In December 1998, Bin Ladin gave a series of interviews in which he denied involvement in the East Africa bombings but said he "instigated" them and called for attacks on US citizens worldwide in retaliation for the strikes against Iraq. Bin Ladin's public statements then ceased under increased pressure from his Taliban hosts. Nonetheless, in 1999, Bin Ladin continued to influence like-minded extremists to his cause, and his organization continued to engage in terrorist planning. His Egyptian and South Asian allies, for example, continued publicly to threaten US interests. Bin Ladin's public remarks also underscored his expanding interests, including a desire to obtain a capability to deploy weapons of mass destruction.

The Government of Saudi Arabia continued to investigate the bombing in June 1996 of the Khubar Towers housing facility near Dhahran and to cooperate with the United States in its investigation of the incident. Saudi authorities arrested and detained several persons in connection with the attack but reached no conclusion in the investigation. The Saudi Government stated that it still was looking for three Saudi suspects linked to the bombing who authorities believed were outside the Kingdom. The United States expelled Saudi national Hani al-Sayegh to Saudi Arabia on 11 October. He faces charges there for his alleged role in the bombing. Al-Sayegh originally was detained in Canada in March 1997, and documents submitted to the Canadian court alleged al-Sayegh, as a member of the Saudi Hizballah, had participated in the Khubar Towers bombing.

Yemen has some of the weakest counterterrorism forces in the Gulf. The primary state security apparatus is the Political Security Organization (PSO), which reports directly to the President. It is independent of the Ministry of Interior. The Criminal Investigative Department (CID) of the police conducts most criminal investigations and makes most arrests. The Central Security Organization (CSO), a part of the Ministry of Interior, maintains a paramilitary force. A paramilitary police or Central Security Unit (CSU) is under the command of Ahmed Nasser al-Dahiri. The civilian authorities do not maintain effective control of the security forces. The US

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State Department reports that members of the security forces, particularly the PSO, committed numerous, serious human rights abuses.[211] More generally, the security forces do not control most rural areas, are far less effective in Aden and the former South Yemen than in the north, are corrupt, and have some ties to Iraq.

Implications for US Policy

Yemen is of limited importance to Gulf security, although it can play an important role in the Red Sea area. The sharp limits on the size of US foreign aid impose equally sharp limits on what the US can do to meet Yemen's most important needs. There are some areas, however, where the US can help Yemen and the overall effort to ensure Gulf stability.

- *The US can encourage Saudi Arabia and Yemen to fully resolve their border disputes, and implement their 2000 agreement.*
- *The US can work with Yemen to help it develop security and investment policies that will expand energy development and its export revenues.*
- *The US can continue to encourage political modernization, efforts to unify the country, and efforts to improve internal security.*
- *The US can strengthen its dialogue with Yemen over economic development*. Once again, this is not simply a matter of encouraging investment. Yemen's plans tend to overreach, reforms are slowly executed, and efforts to attract foreign investment are blocked by a number of regulatory, tax, and procedural barriers. The problem is not that the US has not tried to help, it is that it could raise the level of dialogue, strengthen the embassy team to help, and give the activity higher priority in Washington.
- *Once again, the US needs to quietly push a Gulf nation towards some form of population management policy, as well as better plans to reduce its dependence on foreign labor and create more jobs for native youth.*

In the end, however, Yemen's most important challenges can only be resolved from within. Outside efforts to support and encourage reform plans, and exhortations to take more steps to limit population growth, can only have marginal value. Yemen must assume responsibility for change.

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The Broader Implications for US Policy in the Southern Gulf

The previous country-by-country policy suggestions focus largely on the need to encourage economic reform, efforts to reduce demographic problems, and the need for a constant high level dialogue to ensure the development of suitable oil production and export capability.

This does not mean that the US can ignore its other priorities. Human rights, representative, government, and the rule of law remain important policy goals. None of the Southern Gulf states are Western states. They have their own cultural choices to make, and they may well not choose to follow the same path as the US. US analysts are often far too quick to challenge the legitimacy of Gulf regimes without seriously examining how legitimate they really are in terms of broad local perceptions and whether there is any realistic better alternative. Human rights groups are often equally quick to accept opposition charges without looking closely at the level of violence such opposition groups advocate or practice. Anyone can claim their movement supports democracy and human rights. In fact, virtually every tyranny and dictatorship in the 21st Century did at some point in its history.

The nature and complexity of the problems just outlined should also make it clear that the US will need to stay in the Gulf for decades. There is no quick fix for either energy or security policy. Calls for new regional security arrangements that mean US withdrawal, and a reliance on any form of collective security based solely on the Gulf states is a fantasy. This does not mean that the US should not take prudent steps to minimize its military presence and to avoid cultural and religious tensions. It also seems likely that any combination of the fall of Saddam Hussein and sustained moderation in Iran would lead to the withdrawal of many U.S. forces from the Gulf.

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Even this “best case,” however, would still require the U.S. to play a critical role in securing the ‘four cornered’ balance of power in the Gulf. Neither Saudi Arabia nor any combination of Southern Gulf states seems likely to be able to create a significant deterrent and defense capability to deal with either Iran or Iraq in the near to mid-term. Proliferation may make this equally true in the long-term. The U.S. may not need to be as forward and visible in the future, but unless its power projection forces are capable and credible, the fragile structure of military security in the Gulf could explode at any time.

It is a key theme of this analysis, however, that the US should, however, do its utmost to create effective Southern Gulf military forces, and to develop the highest possible level of cooperative security – both within the GCC and on a multilateral level. Its emphasis should be on the creation of effective forces and not arms sales or burden sharing. The Southern Gulf is no longer wealthy enough to be a bank for US security efforts, and must be treated as a real partner.

The US also needs to understand that it will have to engage be in a continuous political battle for the support (or tolerance) of the peoples in the Southern Gulf states. In the past, it has relied on winning the support of Gulf leaders and the Gulf military. This simply is not enough. Too many people in the Southern Gulf now see the US as thrusting pointless arms sales on their countries, maintaining a massive forward military presence, and provoking or prolonging regional tensions and quarrels to stay in the region. Far too many see the US as a threat to their culture and religion, and as the cause of much of the suffering of the Iraqi people. These charges are untrue, but they cannot be met with the current largely passive character of US diplomatic efforts to reach the peoples of the region – which is dictated in part by Congressional funding constraints that make an effective effort impossible. Like it or not, the struggle for hearts and minds is one that must be won in terms of peoples and not simply in terms of ruling and military elites. It is a struggle that the US now loses risks losing largely by default.

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V. The Challenge from Iran

Iran and Iraq pose the primary challenge to security of America's Southern Gulf allies, the smooth and secure flow of energy exports, and US interests in the Gulf region. Each nation is very different, but both seek to increase their political and strategic influence over the region, and Iraq seeks hegemony. Both are major military powers by regional standards, and significant proliferators. Both are capable of supporting terrorism and asymmetric warfare against the US and its Gulf allies. Both oppose the Arab-Israeli peace process.

US policy must be based on containing both Iran and Iraq and opposing their efforts to proliferate. It must be based on giving each Southern Gulf nation the confidence that the US will deter or defend against any threat from the Southern Gulf. At the same time, the US faces the dilemma that Iran and Iraq are major energy exporters, and the global economy will be increasingly dependent on their exports. It must also deal with the humanitarian reality that they have a total of nearly 100 million people which cannot be held accountable for their leadership.

US policy must recognize the fact that Iran and Iraq cannot be dealt with by similar policies. Neither their regimes nor political dynamics are similar as they present different regional security problems. In fact, the need to take account of such differences was clearly recognized in the original US approach to dual containment, and major political changes have since taken place in Iran that offer real hope of moderation. Iraq, on the other hand remains under the regime of a ruthless aggressor: Saddam Hussein. There are no easy answers to dealing with either nation, and even moderate political leadership in Iran or Iran may not put an end to proliferation. Political change may make the Northern Gulf more stable, and the balance of power easier to deal with, but many problems and challenges are likely to remain.

Iran: "Normalization" and Containment

Iran presents four major policy challenges that the US must deal with over the coming years and where it must seek to find ways to cooperate effectively with its allies and other

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powers. First, the US must seek to deal with the ongoing political struggles between Iran's "moderates" and "hardliners" and find some way to create an effective dialogue between Iran and the US that can create "correct," if not friendly relations. Second, the US must seek to minimize Iran's efforts to challenge its neighbors, support terrorism and extremism, and oppose the Arab-Israel peace process. Third, the US must come to grips with the present sanctions policy in ways that can ensure that Iran's energy policy results in continued and expanded exports of energy. Fourth, the US must find ways to limit the scale of Iran efforts to build up its military forces and proliferate.

The only thing that is certain about the US effort to meet these challenges is that there is no elegant solution that can work, and that neither US efforts to "demonize" or "sanctify" Iran's political leadership will be successful. Efforts to normalize US and Iranian relations may be able to bring a great deal of added stability to the Gulf, as European and Southern Gulf efforts to normalize relations have already shown. The course of the Iranian revolution remains uncertain, however, and normalization without strong US efforts to limit Iran's military build-up and to contain it with a strong regional deterrent could well prove to be dangerous.

At the same time the US failed dismally to convince any of its allies to actively support its sanctions policy, and probably for good reason. A poor Iran is likely to be a dangerous Iran and one driven to take risks with proliferation. Successful economic sanctions would inflict major hardships on Iran's people. Rest of the world needs Iranian energy exports just as much as the US.

The US must find a better balance between containment and normalization. It must be one that takes account of the reality that military containment and deterrence are the priority, not failed adventures in economic sanctions.

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The Challenge of Uncertain Moderation and Political Change

The political situation in Iran is highly unstable, and will probably remain so for at least half a decade. Iran is a nation that is still deeply in the process of revolutionary change, and remains divided between “moderates” who have broad public support, and “conservatives” who control the military, security system, and many other governmental institutions. The “moderates” now seem to be the strongest faction, and might well take a more peaceful and positive course if they can take full control of Iran’s political system.

Since President Ali Mohammad Khatami-Ardakani was elected in May, 1997, with a popular majority of 69%. He soon made it clear that Iran may evolve a more tolerant approach to defining an Islamic state -- one that emphasizes the humanitarian and moral strength of Islam, rather than attempt to force other nations into accepting its concept of repressive and outdated theological rule and social customs. Such change, however, will not come easily. There has been a continuing power struggle between those “moderate” groups that support President Khatami, and the more hardline groups that oppose him and support the Supreme Leader, the Ayatollah Ali Hoseini-Khamenei. This is a struggle involving battles that the hardliners have often won, and the hardliners continue to control the military, the judiciary, internal security services, and state military. There have been numerous arrests of moderates and closings of Iran’s private newspapers.

The pro-Khatami factions have also had their victories, however, and a vast majority of the people of Iran clearly support a more liberal and moderate government. They also want a government that focuses on economic development rather than foreign ideological and military adventures. Iran held its sixth parliamentary elections since the 1979 Islamic revolution on February 18, 2000. The results of the elections gave an overwhelming (over 70% of the vote) victory for the Pro-Khatemi reformist coalition. The outcome of this election, U.S. President Clinton called for a "constructive partnership with Iran."

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The Iranian people are far more concerned with Iran's national interest and economic development than the export of revolution for very good reasons. Iran faces massive problems because of its demographics and a very young population (34% is 14 years of age or younger) with high unemployment and limited job prospects. It averaged 2.7% annual population growth during 1980-1998. Its population grew from 39.1 million in 1980 to 61.9 million in 1998. It is projected to grow to 82.1 million in 2015, and 98 million in 2030. The end result was that real population growth, revolution and war cut per capita income by an annual average of 1.2% during 1965-1998 – a period of nearly a quarter of a century. [212]

Iran's economy is excessively dependent on oil revenues, which accounts for about half the state's budget and 80% of the country's hard currency earnings. In spite of years of effort to reduce it debt, and stringent economic measures and export controls, Iran began 2000 with $16 billion in external debt (including a high proportion of short-term debt). In spite of high unemployment and inflation, the government still pays for state subsidies on many basic goods. Iran has a large, inefficient public sector and it has corrupt state monopolies called "bonyads" that US sources estimate control at least a quarter of the economy and that are answerable only to the supreme leader Ayatollah Ali Khamenei.[213]

Iran announced in 2000 that its non-oil exports actually continued to fall. They were down 5% in the first six months of the Iranian fiscal year, and totaled only $1.5 billion, while total imports rose by 15.5% and reach $7 billion. Exports consisted of $263 million worth of carpets, $165 million worth of chemicals, $107 million worth of pistachios, and $93 million worth of irons and steel. In contrast, Iran imported $1.4 billion worth of industrial machinery, $630 million worth of iron products, $467 million worth of electrical products, and $319 million worth of wheat.[214]1 (This was a minor part of its total food imports, which rise in the second half of the year. Iran ordered 1.3 million tons of wheat from France, Argentina, and Europe in October and was negotiating for more from Australia and Canada.)[215]

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Iran has made a major effort to develop a cohesive economic reform plan under President Khatami, and one that relies heavily on market forces and opening the economy to foreign and private domestic investment. In September 1999, Khatami called for the "total restructuring" of the Iranian economy, a call that is repeated in the country's new five-year economic plan that began in March 2000. He announced a program to privatize several major industries, including communications, post, rail, and tobacco, and plans to consider the privatization of some 2,400 state-owned firms. [216]

Iran is also attempting to diversify its economy by investing some of its oil revenues in other areas. Iran is hoping to attract billions of dollars worth of foreign investment to the country by creating a more favorable investment climate. The government has discussed measures, much as possible constitutional amendments, reduced "red tape," reduced restrictions and duties on imports, creation of free-trade zones, and increased safety of foreign investments. Iran's government has also announced the possibility allowing foreign investment in its mining and metals sectors. It opened its stock market to foreign investment for the first time in 2000, and began to make significant reforms in its banking system. It also issued plans to use its unexpectedly high oil revenues to release money from its stabilization fund to allow added private sector investment.[217]

The balance of power in Iran remains highly uncertain, however, and revolutions can become more extreme, as well as more moderate. Iran’s pragmatists and moderates still face strong traditionalist and radical opposition and it is the hardliners who control the command of the military, Revolutionary Guards, intelligence services, security services and most of the judiciary. Iran’s revolution may yet become the captive of ambitious leaders or elites. Conservative or extremist reaction can suppress the positive trends in political and social development, and nationalism and regional ambition can still turn ideology into an excuse for aggression. The “moderates” have made only limited progress towards economic reform. Economic failure can also end in aggression, authoritarian rule, and social repression.

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This does not mean that the US should be pessimistic about political change in Iran or should not encourage it. The popular elections in Iran clearly show that that its populace – and particularly its young people – are tired of religious extremism, the lack of any clear economic future, and isolation. Even many of Iran's so-called "hardliners" also now realize a Persian Shiite Revolution cannot sweep an Arab Sunni world. They also realize the Sunni extremists in Afghanistan now pose a threat to Iran and that Sunni, not Shiite movements dominate Islamic thought in Central Asia. It is also important to remember that while the "hardliners" control the top command of the military and Revolutionary Guards, the vast majority of Iran's troops are conscripted young men from an age group that voted overwhelmingly for Khatami.

It does mean that the US should be cautious about what "moderate" will prove to mean. Pragmatic nationalism does not mean pro-American, or abandoning Iran's desire to be the most significant power in the Gulf. About 20-30% of young Iranians vote as "hardliners" and many young "moderate" Iranians, as well as older "moderates," still see the US as the supporters of the Shah, the leading power backing Iraq in the Iran-Iraq War, and as a rival. US support for Israel is scarcely popular in Iran, and few Iranians see Hamas, the Palestinian Islamic Jihad (PIJ) or Hezbollah as "terrorists."

Iran is not likely to abandon its efforts to be a leading Gulf military power, if not *the* leading Gulf military power, regardless of the nature of the regime and whether it is included in some form of Gulf security regime. It may moderate its efforts to proliferate and limit any open deployment: It may even restrict the range of its delivery systems but only if it sees a strong incentive to do so, or feels far more secure than it is today. Even then, virtually any Iranian regime is not going to ignore Iraq, Pakistan, Israel, and US power in the Gulf and cease to proliferate at least the RDT and E at the contingency level.

It is equally important to understand that terms like "moderate" and "hardliner" disguise a very wide range of different views and a far more complex set of differences within Iran's leadership. Iran does not consist of two factions, one of which is struggling to create friendly

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relations with the US. It consists of a wide range of different Iranian nationalists with different views of Iran's best national interest and most of whom differ in some important ways with the policies and interests of the US.

Iran's foreign policy is also in transition, hopefully to a moderate policy that concentrates on development and considers security more in defensive terms. However, deep contradictions remain. There have been no reductions in Iran's efforts to proliferate and improve its military capabilities in the Southern Gulf. Iran has reduced its support for terrorism in the Southern Gulf, and its involvement in incidents in the region has declined sharply since Khatami's election, but, Iran's training facilities and infrastructure remain intact and both US and regional experts have not detected a change in Iran's efforts to build-up its Revolutionary Guards and capabilities for asymmetric warfare.

Iran and the Southern Gulf

Iran has made progress in improving relations with a variety of countries. In December 1997, Iran hosted the Organization of the Islamic Conference (OIC) in Tehran. During this well-attended (more than 50 countries) meeting, Iranian President Khatami met twice with Saudi Crown Prince Abdullah, the first such high-level meetings between Iranian and Saudi leaders since the 1979 Iranian Revolution. The meetings led to steadily better relations between the two countries. In February 1998, former President Rafsanjani visited Saudi Arabia for 10 days for talks on improving bilateral ties and formulating a "security and economic strategy" for boosting security in the region. Rafsanjani was the most senior Iranian to visit Saudi Arabia since the 1979 Iranian Revolution. Iranian and Saudi relations continued to improve in 1998 and 1999, including a visit by President Khatami to Saudi Arabia in May 1999.

In the spring of 2000, Iran and Saudi Arabia developed a pact that some initially called as a "defense pact," but was actually an agreement to fight crime, terrorism, and drug trafficking. Neither state is interested in a true alliance, but this normalization of relations between the two countries reshapes the balance of power in the region against Iraq, which both conceive as a

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common enemy. It is hardly surprising that Iraq has been critical of the rapprochement that increasingly isolates it among the other states of the region.

Iran has also improved relations with Kuwait, Bahrain, Qatar, and Oman. There seems to be a broad understanding in Iran that its efforts to export a Persian-Shi'ite form of Islamic Revolution have failed, and have no prospects future success. While some hardliners still have hopes, it seems likely that leaders as Khatami, Rafsanjani, and Khamenei all realize that better relations with the Southern Gulf states reduce the chance of any clash with the US, undermine support for US sanctions, and undercut support for Iraq.

The key remaining problem area in Iranian relations with the Southern Gulf states is the UAE. As has been discussed earlier, Iran seized Abu Musa and the Greater and Lesser Tubs from the emirate of Ras al-Khaimah in 1971. Iran claimed full sovereignty, but reached a face-saving agreement with the UAE to "share" Abu Musa. In 1992, Iran claimed sovereignty over Abu Musa despite the 1971 agreement between the two countries. The UAE still maintained joint control of Abu Musa until 1994, when Iran took full control of the island. Negotiations with the United Arab Emirates (UAE) over Abu Musa and the Tunb Islands have remained stalled ever since.

The Iranian Foreign Ministry issued a statement in December 1995 declaring that the islands are "an inseparable part of Iran." In 1996, Iran took further steps to strengthen its hold on the disputed islands. These moves included starting-up a power plant on Greater Tunb, opening an airport on Abu Musa, and planning the construction of a new port on Abu Musa. Iran also rejected a proposal by the Gulf Cooperation Council in March 1996, which advocated that the International Court of Justice resolve the dispute, an option supported by the UAE.

The UAE has generally received strong support from the GCC, the United Nations and the United States, but Iran can scarcely be disappointed by the fact that the UAE and Saudi Arabia quarreled over Saudi Arabia's steadily improving relations with Iran in May-June 1999. In December 1997, the UAE called for talks with Iran over the islands. In early March 1998, the GCC, while praising Iran's President Khatami, issued a statement supporting the UAE in its

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dispute with Iran over Abu Musa and the Tubs. Since that time, Iran has shown that it is at least willing to discuss the issue with the UAE, and the foreign ministers of the two countries have exchanged visits. At the same time, Iran is equally aware that even the UAE is not completely unified over this issue. The Emirate of Dubai is one of Iran's most important trading partners, while Abu Dhabi and Ras al-Khaimah that are responsible for much of the anti-Iranian rhetoric. A waiting game favors Iran.

Iran and Iraq

Iran still sees Iraq as its most serious enemy, although it has made efforts to reduce the level of tension between them. Iraq and Iran opened a dialogue in 1997 that led to an exchange in April of 1997 of the remains of 75 soldiers killed on both sides during the Iran-Iraq War. Since that time Iran and Iraq have agreed to exchange all prisoners, and establish more normal relations, and Iraq allowed Iranian pilgrims to visit Shi'ite religious shrines in Iraq for the first time since 1979. Iran has also sporadically assisted Iraq in smuggling refined products, mainly diesel fuel, to international markets. Relations, however, are still anything but friendly. Major problems exist over Iraq's treatment of its Shi'ites and the assassinations of three major ayatollahs in Iraq during 1998-1999. Both nations deploy a substantial portion of their military forces to defend against an attack by the other state, and both host armed opposition movements that oppose the other's regime on their territory. Both have lasting memories of the Iran-Iraq War, and both are involved in a race to proliferate. Iran has repeatedly attacked by the People's Mujahideen, a violent opposition group based in Iraq, on and has bombed its bases in Iraq in 1997, 1998,1999, and 2000.

Terrorism, Unconventional Warfare, Israel, and Lebanon

Iran has begun to openly debate its attitudes towards Israel since President Khatami's election. While Iran's statements are often ambiguous and sometimes contradictory, both President Khatami and his foreign minister have indicated on several occasions that a peace Syria agrees to will be seen as legitimate, that Iran's support of Hezbollah may only extend to the

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liberation of Lebanon, and that Iran will accept a peace to which the Palestinian people agree. However, such statements are ambiguous and the Ayatollah Khamenei and Iran's traditionalists still see Israel as an illegitimate entity. Iran's hard-liners continue to see Israel as an enemy that must be destroyed.

Unfortunately, Iran's hard-liners seem to control Iran's military liaison with Syria, its support of Hezbollah in Lebanon, its acquisition of long-range missiles and weapons of mass destruction, and its support of anti-peace factions among the Palestinians like Hamas and Islamic Jihad. There is also a broader based concern in Iran about Israel's long-range strike capabilities and nuclear weapons and is treatment of the Palestinians and occupation of Lebanon, that cuts across factional lines.

The 1999 edition of the US State Department report on the Patterns in Global Terrorism describes Iran's involvement in terrorism as follows:[218]

> Although there were signs of political change in Iran in 1999, the actions of certain state institutions in support of terrorist groups made Iran the most active state sponsor of terrorism. These state institutions, notably the Revolutionary Guard Corps and the Ministry of Intelligence and Security, continued to be involved in the planning and execution of terrorist acts and continued to support a variety of groups that use terrorism to pursue their goals.
>
> A variety of public reports indicate Iran's security forces conducted several bombings against Iranian dissidents abroad. Iranian agents, for example, were blamed for a truck bombing in early October of a Mujahedin-e Khalq (MEK) terrorist base near Basrah, Iraq, that killed several MEK members and non-MEK individuals.
>
> Iran continued encouraging Hizballah and the Palestinian rejectionist groups—including HAMAS, the Palestinian Islamic Jihad, and Ahmad Jibril's PFLP-GC—to use violence, especially terrorist attacks, in Israel to undermine the peace process. Iran supported these groups with varying amounts of money, training, and weapons. Despite statements by the Khatami administration that Iran was not working against the peace process, Tehran stepped up its encouragement of, and support for, these groups after the election of Israeli Prime Minister Barak and the resumption of Israel-Syria peace talks. In a gesture of public support, President Khatami met with Damascus-based Palestinian rejectionist leaders during his visit to Syria in May. In addition, Iranian Supreme Leader Khamenei reflected Iran's covert actions aimed at scuttling the peace process when he sponsored a major rally in Tehran on 9 November to demonstrate Iran's opposition to Israel and peace. Hizballah and Palestinian rejectionist speakers at the rally reaffirmed their support for violent *jihad* against Israel. A Palestinian Islamic Jihad representative praised a bombing in Netanya that occurred days before and promised more such attacks.
>
> Tehran still provided safehaven to elements of Turkey's separatist PKK that conducted numerous terrorist attacks in Turkey and against Turkish targets in Europe. One of the PKK's most senior at-large leaders, Osman Ocalan, brother of imprisoned PKK leader Abdullah Ocalan, resided at least part-time in Iran.

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> Iran also provided support to terrorist groups in North Africa and South and Central Asia, including financial assistance and training.
>
> Tehran accurately claimed that it also was a victim of terrorism, as the opposition Mujahedin-e Khalq conducted several terrorist attacks in Iran. On 10 April the group assassinated Brigadier General Ali Sayyad Shirazi, the Iranian Armed Forces Deputy Chief of the Joint Staff.

As has been noted earlier, other aspects of Iran's ties to terrorism remain ambiguous. Iran has reduced its subversive and terrorist activity in the Gulf and Europe, but it has not reduced its surveillance of US forces and facilities in the region nor reduced its arms shipments to Hezbollah. Iran supplied Hezbollah with new, longer-range rockets, although these may have been shipped before the election of the moderate Khatami. Mohammed Sadr, Iran's new Deputy Foreign Minister, first visited Damascus on September 9, 1997 to discuss the security situation in Lebanon and pledged continued military aid to Hezbollah. Since then, Iran has continued to ship plane-loads of arms to the Hezbollah, and Iranian senior officials have continued to meet regularly with Syrian officials and the leadership of Hezbollah. Iran also continues to provide funds and paramilitary training to extremist Palestinian groups like the armed wing of Hamas and the Palestinian Islamic Jihad.

At a theoretical strategic level, Iran and Israel have little reasons for conflict, particularly now that Israel no longer occupies the largely Shi'ite areas in Southern Lebanon. Nevertheless, Israel makes a convenient political whipping boy for Iran, and one where the whip is often wielded out of real conviction. Until the peace process is fully successful revived, and receives broad Arab and Islamic support, Iran is almost certain to continue to attack Israel's legitimacy and to support Arab hard-liners. This will probably involve the support of violent anti-Israeli groups, and military cooperation with Syria. The most the US and the West cam realistically hope for is that Iran will soften its rhetoric and not actively and openly support violence.

Iran, Afghanistan, Pakistan, and Central Asia

As is discussed in Chapter X, Iran has many of the same problems with Afghanistan as the US. Despite substantial interdiction efforts, Iran remains a key transshipment point for Afghani, heroin shipments to Europe; and domestic consumption of narcotics remains a persistent problem. The Iranian press reports estimates that there are at least 1.2 million drug users in the country.[219]

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Afghanistan's "Islamic Revolution" also persecutes its Shi'ites and has created a massive refugee problem in Iran. As a result, Iran is now in the ironic position of suffering more from Islamic extremism than any other nation in the Gulf. It is also clear to Iran that it is Sunni's and "Neo-Wahhabis," that dominate religious fervor in Central Asia, and cannot exert major influences over any Caspian or Central Asian regime. Iran has for more to gain form trade, gas and oil swaps than political adventures.

The Challenge of Iran's Energy Policy and Sanctions

For the world outside the Gulf, The key strategic issue in Iran is energy. Whatever happens in terms of its domestic politics, Iran will have vast strategic importance in shaping the future of the world's energy balances. The U.S. Department of Energy estimates that Iran holds 93 billion barrels of proven oil reserves, or roughly 9% of world's total.[220] The majority of Iran's crude oil reserves are located in giant onshore fields in the Khuzestan region near the Iraqi border and Persian Gulf terminus. More than half of Iran's 40 producing fields contain over one billion barrels of oil. The onshore Ahwaz, Marun, Gachsaran, Agha Jari, and Bibi Hakimeh fields alone account for about two-thirds of Iran's oil production. Most of Iran's crude oil is low in sulfur and light, with gravities in the 30^{o}-39^{o} API range.

Iran may, also have large additional reserves. Iran was not been able to carry out intensive oil exploration activity for nearly two decades because of the fall of the Shah, the Iran-Iraq War, and economic problems. It has, however, made important discoveries in recent years. While it has sometimes made exaggerated claims, the National Iranian Oil Company (NIOC) has made several sizable oil discoveries since 1998. These include the 2.5-billion-barrel Darkhovin field, located offshore near Abadan, and a giant onshore field called Azadegan which was discovered in 1999 and is located in the southwestern province of Khuzestan which Iran found in October 1999. Iran claims the Azadegan field could contain 26 billion barrels of oil, with potential recoverable reserves of 5-6 billion barrels and production levels of 400,000 bbl/d.[221] Iran claimed in August 2000 that it had discovered a another new field with reserves of more than one billion barrels in Southern Busher province, and a new gas field with more than 800 billion cubic feet of gas. A

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week earlier, it has said it has discovered a new gas field with 4.7 trillion cubic feet of gas at Homa.[222] Iran now claimed its total oil reserves were 520 billion barrels, and that 25% would be recoverable with modern enhanced oil recovery (EOR) technology.[223].

Iran is OPEC's second largest oil producer, with an average current output of 3.55 million bbl/d (MMBD), nearly all of which is crude oil. Iran's current sustainable production capacity is estimated at around 4 MMBD, but this figure is controversial, with some claiming that Iran has maintained production levels at some older fields only by using methods that have permanently damaged the fields. [224].

The EIA estimates that Iran will expand its oil production capacity from an average of 3.9 million barrels per day in 1998, to 4.3 MMBD in 2005, 4.5 MMBD in 2010, and 5.5 million barrels per day in 2020. To put these numbers in perspective, the EIA estimates that Iran will maintain a steady 5% share of world production from the present to 2020. [225] It is important to note, however, that Iran is also a heavy domestic consumer of oil. Its daily use is roughly 46 million litres, largely because prices are so low there is little excuse for efficiency. As a result, Iran has roughly the same oil consumption as India, which has a population nearly 12 times larger.[226]

Iran is also a major gas producer. It has gas reserves of 812. 3 TCF. Iran has the second largest set of national reserves in the world, and is 15.7% of all proven world reserves.[227] The bulk of Iranian gas reserves are located in non-associated fields, and has not been developed, meaning that Iran has huge potential for gas development. Besides domestic consumption, which is growing rapidly, Iran also has the potential to be a large natural gas exporter. In 1998, Iran produced about 1.9 Tcf of natural gas. Currently, natural gas accounts for around 40% of Iran's total energy consumption.

Iran continues to promote export markets for its natural gas. Options include pipelines to Turkey, Armenia, Europe, Pakistan, and India, plus the possibility of an LNG facility for producing exports to Asia. Iran and Turkey signed a $20-billion agreement in 1996 that calls for Iran to supply Turkey with natural gas over a period of 22 years. Turkey began construction of a

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623-mile pipeline in November 1998 that could transport gas westward from Iran, and exports of Iranian gas were slated to start in 1999 at an initial rate of 300 Mmcf/d and rise to a level of 1,000 Mmcf/d in 2005.,. In January 2000, however, Iran said that it accepted Turkey's request to delay the purchase of Iranian natural gas until September 2001. Turkey said that it had been unable to complete its portion of the pipeline due to economic problems.[228]

Iran's Energy and Sanctions

The dilemma for US policy is that US sanctions are now designed to block precisely the kind of Iranian energy development that the US and the global economy need. The US placed Iran under unilateral sanctions when the US Congress unanimously passed the Iran-Libya Sanctions Act (ILSA) and President Clinton signed it into law by in August 1996. This act imposes mandatory and discretionary sanctions on non-U.S. companies which invest more than $20 million annually (lowered in August 1997 from $40 million) in the Iranian oil and gas sectors.

The passage of ILSA was not, however, the first U.S. sanction against Iran. The US Congress had previously pressured President Clinton into signing two Executive Orders in early 1995 that prohibit U.S. companies and their foreign subsidiaries from conducting business with Iran. These executive orders also ban any "contract for the financing of the development of petroleum resources located in Iran." On August 19, 1997, President Clinton signed a broader order -- Executive Order 13059 -- reaffirming the prohibition of virtually all trade and investment activities by U.S. citizens in Iran are prohibited.[229]

It is important to note that President Clinton issued these Executive Orders and signed the ILSA for reasons that had for more to do with domestic politics than foreign policy considerations. He was under sharp Congressional pressure because of his personal problems. Republican Congressmen were trying to portray the President as weak on Iran, and were seeking the support of pro-Israel lobbying groups.

Clinton embraced the congressional sanctions policy in spite of the advice of advisors who felt that it would do more to reinforce the anti-US position of Iran's hardliners than effect Iran's

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military efforts. They pointed out that Iran was not involved in a major military build-up and could afford to fund its efforts to proliferate and improve limited parts of its capabilities to attack shipping in the Gulf regardless of US sanctions. It was also clear that the US had no hope of winning broad allied and international support; and that President Rafsanjani – President Khatami's predecessor – was seeking to reach some form of accommodation with the US by offering Iranian oil deals to US firms on favorable terms.

The Impact of US Sanctions

As a result of the Executive Orders that President Clinton signed in 1995, Conoco was obligated to abrogate a $550-million contract to develop Iran's offshore Sirri A and E oil and gas fields. This blocked President Rafsanjani's efforts to make an indirect approach to improving relations with the US, and set a precedent that has been all to clear to President Khatami. The threat of secondary U.S. sanctions also deterred some multinationals from investing in Iran. In August 1996, Australia's BHP withdrew from a proposed $3-billion pipeline project to transport Iranian natural gas to Pakistan and India under the threat of U.S sanctions. U.S. efforts to discourage the Indonesian firm Bakrie from proceeding with the development of the Balal oilfield probably contributed to Bakrie's decision to withdraw, although the impact of the Asian financial crisis may have been at least as important.

As was expected, however, US attempts to implement ILSA ran into strong opposition from most foreign governments. The European Union (EU) opposed the enforcement of ILSA sanctions on its members, and passed resolution 2271 directing EU members to not comply with ILSA on November 22, 1996. The US was forced to back down and the EU and the U.S. reached an agreement on a package of measures to resolve the ILSA dispute at the EU/US Summit in London on May 18, 1998.

Iran's Buyback Options

Iran reacted by existing new incentives for foreign investment. The Iranian constitution prohibits granting of petroleum rights on a concessionary basis to any private or outside interest.

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However, the Petroleum Law of 1987 permits the establishment of contracts between the Ministry of Petroleum, state companies and "local and foreign natural persons and legal entities." In August 1998, the ministry announced invitations to bid on 43 petroleum projects worth some $8 billion in what has come to be known as the "buyback" investment methodology.[230]

The EIA reports that these buyback contracts are essentially risk-service contracts where which the contractor funds all investments. The contractor then recovers its investment from producing a commercial field and receives remuneration from NIOC. The remuneration is based on an agreed contractor rate of return (15-17%) and is paid in the form of NIOC's allocation of a share of production equal in value to the amount due. This system has drawbacks for both sides: the NIOC has to offer a fixed rate of return and bears all the risk of low oil prices. If prices drop, NIOC has to sell more oil or gas to meet the compensation figure. At the same time, companies have no guarantee that they will be permitted to develop their discoveries, let alone operate them.

In spite of US sanctions and such drawbacks, these new Iranian incentives helped lead a consortium led by Total (France), Gazprom (Russia), and Petronas (Malaysia) to sign $2-billion buy back deal to explore Iran’s South Pars gas field on n September 29, 1997, and to help develop the field during Phase 2 and 3 of its development. The US simply could not afford the potential cost of trying to enforce sanctions to oppose this deal and had to grant the a waiver under Section 9C of ILSA by the United States in May 1998.

This set a precedent that greatly undercut the threat of US sanctions. U.S. Secretary of State Madeleine K. Albright noted that the United States had concluded that sanctions would not prevent this project from proceeding, and stated that the waiver was also granted because of the cooperation achieved between the United States, the EU, and Russia in accomplishing ILSA’s primary objective of inhibiting Iran’s ability to develop weapons of mass destruction and support of terrorism. The reality, however, was that the US had to cave because it had no support from even close allies like Britain.

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Total and Malaysia's Petronas also proceeded with development of the same Sirri A and E oil and gas fields that Conoco was developing. Technically, Total did not violate ILSA sanctions for the Sirri project despite the $600 million size of this investment because the deal was signed prior to the enactment of ILSA, but it had also carefully divested itself of any operations the US could sanction and made US threats pointless. Petronas, which acquired a 30% stake in the Sirri deal in 1996, stated in early March 1998 that it would not withdraw from the project despite U.S. objections. A wide range of other foreign oil companies are investing in Iran in spite of US sanctions.

The first major project under the buyback investment scheme became operational in October 1998. The offshore Sirri A oil field (operated by Total and Malaysia's Petronas) began production at 7,000 bbl/d, and is now producing around 20,000 bbl/d. The neighboring Sirri E field began production in February 1999, and production is expected to reach 100,000 bbl/d. In March 1998. There have been many other deals since that time. Canada's Bow Valley Energy and UK's Premier Oil signed a $270-million deal to develop the offshore Balal field. The field, which contains some 80 million barrels of reserves, will produce up to 40,000 bbl/d, possibly beginning in late 2001. Bow Valley joined with Premiera after Indonesia's Bakrie Minarak Petroleum pulled out of the project due to financial problems stemming from the Asian economic crisis. In December 1999, the Indian Oil Corporation and the Oil and Natural Gas Corporation reportedly agreed to acquire 35% equity in Balal.

In March 1999, France's Elf Aquitaine and Italy's ENI/Agip signed a $540-million (in capital expenditures) deal for a secondary recovery program on the offshore Doroud oil and gas field near Kharg Island. The program is intended to boost production from current levels of around 150,000 bbl/d to as high as 220,000 bbl/d. Production is scheduled to begin in 2000 and peak in 2003, continuing for another 25 years.

On November 14, 1999, Shell announced that it had been chosen for an $800-million project to develop the Soroush and Nowruz offshore oil fields. These fields are located about 50

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miles west of Kharg Island and contain recoverable reserves of up to 400 million barrels of mainly heavy oil. Soroush was one of the original 11 projects put out for tender by NIOC in 1995, and the project calls for Shell to raise output at Soroush to 100,000-150,000 bbl/d (from 60,000 bbl/d currently), and at Nowruz to 90,000 bbl/d. The Shell deal poses the most serious challenge yet to US sanctions under ILSA.[231]

Iran is also seeking buyback deals for gas. It is currently seeking some $1.4 billion in foreign investment by March 2002. This is largely to fund Iran's master development plan for its large gas field at South Pars. In announcing these plans in August 2000, Iran's deputy oil minister, Hamdollah Mohammed-Nejah, noted that Iran's current gas consumption nearly equaled production, and that it had already contracted to send 228 billion meters a year to Turkey, and was negotiating contracts to see gas to Armenia, Nakhichevan, and possibly India. He stated that Iranian's were consuming 160 million cubic meters of gas a day, and that increasing gas production by 2002 could allow Iran to export an additional $2 billion worth of oil per year.[232] This again illustrates the dilemma in limiting Iran's access to investment and its potential impact on world oil production capacity.

The Clinton Administration has effectively abandoned any rigorous effort to enforce ILSA. The United States has not only been forced to grant waivers, it has recognized that sanctions help block its efforts to establish a formal dialogue with the Khatami faction and strengthen Iran's moderates, and have had little, if any, impact on Iran's military efforts. The US modified its sanctions on April 28, 1999 to allow shipments of donated clothing, food and medicine for humanitarian reasons (trade in informational materials such as books and movies is also allowed). It eased sanctions further in 2000, including provisions that helped reduce sanctions on the export of pistachios – which are largely controlled by the Rafsanjani family.

However, all other U.S. sanctions against Iran remain in force. The U.S. denied Mobil's request to swap crude oil from Kazakhstan with Iran on the same day that the humanitarian exceptions were made. Sanctions also close Iran to US companies and block them from any

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investments that could create strong commercial ties with Iran's private sector and help in the course of Iranian moderation. U.S. law permits American companies to buy the bid packages ($10,000 each), but not to submit proposals. Several U.S. firms are reportedly interested in the buyback offers, including Chevron, Arco, Kerr-Mcgee, Unocal, Conoco and Mobil. Arco and Mobil have officially notified Iran that they are interested in the projects and have applied to purchase oil field data.

Sanctions and Iranian Oil Exports and Export Revenues

Iranian oil exports remain high in spite of US sanctions. Production has averaged over 3.6 MMBD in 2000, and Iran's export quota rose close to four million barrels in September 2000. Iran also is enjoying peak oil revenues because of the recent boom in oil prices.[233] This represents a major change and one that certainly undercuts the effectiveness of sanctions. In fact, Iran announced in October 2000 that its initial projections of $11.5 billion a year in government oil revenues would be some $7-8 billion higher than projected.[234]

This is scarcely something Iran can count on. Iran has faced major swings in its oil revenues over the last few decades, but far more because of internal instability, revolution, war, and the market than because of the minor impact of US sanctions. Iran's oil revenues rose from $12.9 billion in constant $1990 dollars in 1972 to $20.9 billion in 1980, in spite of the fall of the Shah and the beginning of the Iran-Iraq War. War and cuts in oil prices reduced its total revenues to only $6.7 billion in constant dollars in 1986.[235]

Its revenues recovered steadily after the end of the Iran-Iraq War in 1988, surged during the Gulf War in 1990, and then remained relatively moderate until late 1997. Iran's economy, which relies heavily on oil export revenues (around 80%-85% of total export earnings, for instance), was hit hard by the need to repay gross over-borrowing and the resulting debt built up under President Rafsanjani and by record-low oil prices during 1998 and early 1999.

Low oil prices also exacerbated Iran's budget shortfall during 1998, which has become a chronic problem. This budget shortfall had nothing to do with the military expenditures the US

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was trying to limit, but rather the result of a combination of failed economic policies corruption, failed agriculture reform, the inefficiency of religious foundations and large-scale state subsidies—totaling some $11 billion per year—including foodstuffs and especially gasoline. It was also due to the near impossibility of planning stable budgets in a oil-dependent economy. Iran gains or loses around $800 million in revenues for every $1 per barrel change in the price of its oil.

The rebound in oil prices in the spring of 1999 has changed this situation. Iran's oil export revenues are expected to reach $22 billion in 2000, up 58% from 1999 and more than double its 1998 revenues. Iran's real GDP grew by 2.5% in 1999, and is expected to grow by at least 4.2% in 2000. Easing Iran's budget problems, however, does not give it wealth. Its revenues for 200O will, only total $16-20 billion in constant 1990 dollars. This is not dramatically different from Iran's oil revenues in 1973, and Iran now has three times the population.[236]

Despite high oil prices, Iran will also continue to face budgetary pressures despite high oil prices. It now has to pay for its the past failure to effectively implement two decades of different development and reform plans under two radically different regimes, war and revolution, a rapidly growing and young population with limited job prospects and over-dependence on oil export revenues. US sanctions certainly have added to those problems. In balance, however, the US Executive Orders and ILSA may have done as much to hurt US oil companies, and isolate the US from the kind of commercial ties that might improve US and Iranian relations, than to hurt Iran.

Energy, Iran, the US, and the Caspian and Central Asia.

The US and Iran have taken very different positions on the development of energy in the Caspian. Iran's strategic position has a major impact on the development of energy resources in the Caspian and Central Asia. It contends that treaties signed in 1921 and 1940 are still valid. This implies that all countries bordering the Caspian must approve any offshore oil developments. In late February 1998, Iran's Foreign Minister Kamal Kharrazi reiterated Iran's position that any unilateral exploitation of Caspian Sea resources would be illegal. Iran backs national zones extending several miles from the coast and a "condominium" in the middle of the Sea. Iran has

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stated (along with Russia) that it opposes laying an oil pipeline across the Caspian Sea floor. and Iran sees itself as a natural transit route for oil and gas exports from the landlocked Central Asian countries to world markets.[237]

For the same reasons that the US imposed the sanctions, U.S. policy has opposed Iran's effort to play a role in Caspian and Central Asian efforts to develop their energy resources and the creation of new pipelines through Iran, which many outside experts feel is the shortest (and most likely the least expensive) path to the open sea, as part of its attempt to isolate Iran and to contain its influence in the region, the United States has strongly supported an agreement by Turkey, Azerbaijan, and Georgia to install a 1,080 mile $2.4 billion pipeline from Baku, Azerbaijan through the Caucasus region to the Turkish Mediterranean port of Ceyhan. Two multi-billion-dollar agreements were signed -- by Turkey, Azerbaijan, Georgia, and Turkmenistan -- to develop the Baku-Ceyhan oil pipeline in November 1999.[238]

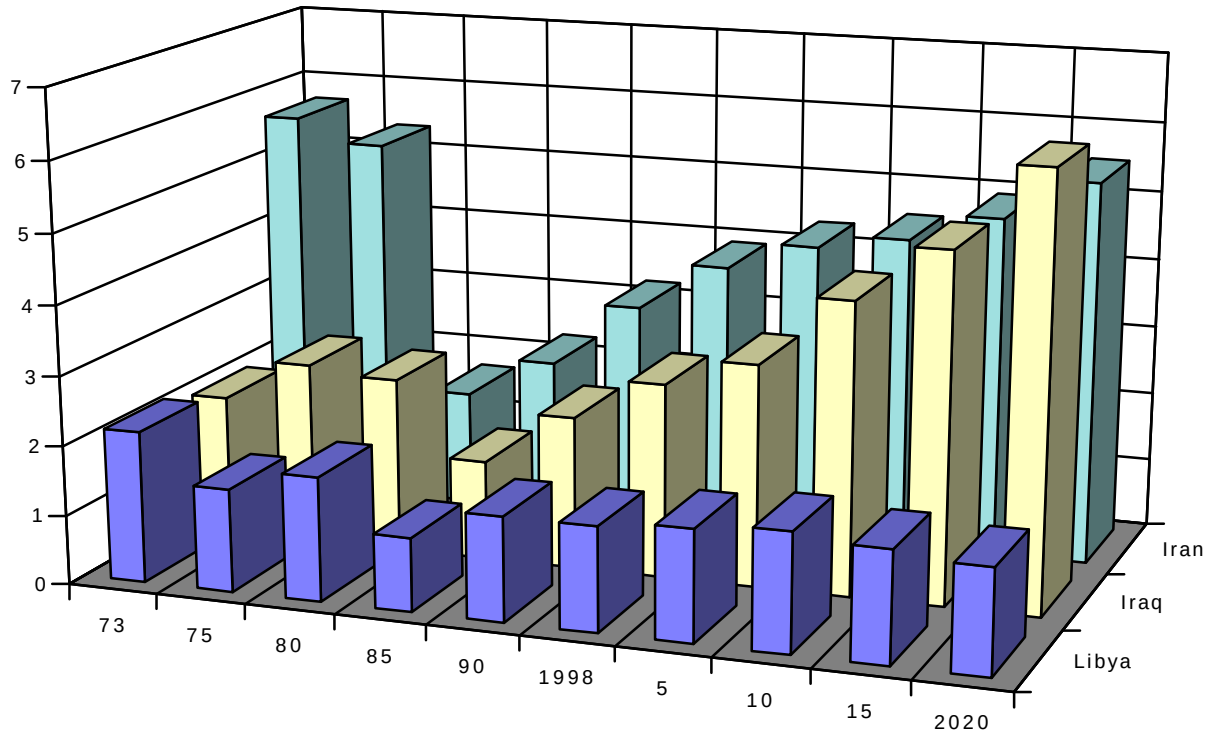
This dispute also affects swaps of crude oil in ways that hurt US companies but ultimately are unlikely to do as much to hurt Iran. Several US and European firms have proposed oil "swaps" involving the delivery of Caspian oil to refineries in northern Iran, while the same amount of Iranian oil is exported through Persian Gulf terminals. According to Iranian Oil Minister Bijan Namdar-Zangeneh, Iran is planning to retool its oil infrastructure to accommodate such swaps, including construction of a $400-million, 240-mile pipeline from the Caspian area via Iran's Caspian port of Neka to refineries in northern Iran and to Tehran. NIOC already has reached agreement with a Chinese consortium on the technical aspects of the project, which is expected to transport 175,000 bbl/d of Caspian crude within two years, and ultimately up to 370,000 bbl/d. Also, European oil trading company Vitol has expressed interest in financing the project. The US has opposed efforts by firms like Mobil to make such swaps.[239]

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Figure V-1

EIA Estimates of Future Iranian and Iraqi Oil Production: Today's "Rogues" Had Damn Well Better Be Tomorrow's Suppliers: 1995-2020

(EIA Reference Case Estimate in MMBD)



	73	75	80	85	90	1998	5	10	15	2020
Libya	2.175	1.48	1.787	1.059	1.5	1.5	1.6	1.7	1.6	1.5
Iraq	2.018	2.62	2.514	1.433	2.2	2.8	3.2	4.2	5	6.2
Iran	5.681	5.35	1.662	2.25	3.2	3.9	4.3	4.5	4.9	5.5

Source: Adapted by Anthony H. Cordesman from EIA, International Energy Outlook, 2000, DOE/EIA-0484 (00), April 2000, pp. 229, and EIA, Monthly Energy Review, April, 1997, pp. 130-131. Note that total world production is 69.7 MMBD in 1990, 73.0 MMBD in 1995, 81.4 MMBD in 2000, 90,5 MMBD in 2005, 98.1 MMBD in 2010, and 106.9 MMBD in 2015.

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The Challenge of Iran's Military Forces and Proliferation

The primary threat US policy towards Iran must deal with is not terrorism or the export of revolution, but rather the risk of Iran might use military force to threaten or intimidate its neighbors. At the same time much of Iran's military behavior is defensive and is explained by the continuing threat from Iraq, its fear of U.S. intervention, and its desire to play a major – if not dominant – military role in the region.

Iraq's military capabilities may have been greatly weakened by the Gulf War, but Iraq remains a stronger military power than Iran. Iraq has roughly 429,000 active men in armed forces versus approximately 585,000 men (plus 250,000 conscripts) in both Iran's regular forces and the Revolutionary Guards. Iraq has 2,200 main battle tanks and about 2,900 other armored vehicles compared to less than 1,400 and 700 respectively for Iran.[240] The only category of major land weapons in which Iran is superior is artillery, and this superiority consists largely of obsolete towed artillery weapons that have defensive value, but which are extremely difficult to use effectively in maneuver warfare.

Iran has developed a carefully focused military capability to threaten shipping in the Gulf. This capability includes the purchase of three Russian submarines with mine-laying capabilities, and advanced naval mines. It includes the deployment of a wide range of anti-ship missiles on small craft and in land bases near the main shipping channels through the Gulf. It includes the creation of a large force of Revolutionary Guards equipped for anti-ship and amphibious warfare. Iran now has enough naval capability stationed along the Gulf coast, in the Strait of Hormuz, and deployable in the Gulf of Oman to harass shipping and require a major U.S. response if Iran should take offensive action. Iran has also focused its resources on obtaining long-range missiles and weapons of mass destruction, and the ability to fight unconventional warfare.

This kind of "focused poverty" allows Iran to get the maximum amount of regional influence and intimidation per Rial, but it has scarcely given Iran much war fighting capability against any regional coalition that involves the U.S. Iran also has good reasons not to become involved in such a war. It is highly dependent on its oil export revenues and has no way to export

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any significant volume of oil except through the Gulf. It cannot defend its oil facilities against U.S. missile and stealth bomber attacks, and its naval and anti-ship missile forces cannot survive for more then days to weeks in the face of U.S. military action. Iran's mine warfare capabilities may pose a threat in terms of long-term harassment, but they cannot block the Gulf. Iran lacks modern land-based air defenses, has limited modern fighter strength, has only about 30 modern attack aircraft (the Su-24), and has no modern airborne sensors and command and control assets. Its military forces and bases are open to U.S. retaliation.

The Size and Character of Iran's Military Efforts

US experts feel that the regular Iranian land forces has around 175,000-180,000 men, the air and air defense forces have 30-35,000, and the Navy has around 18,000. They estimate that the Revolutionary Guards have around 120,000 men with a naval branch of 18,000-20,000. Iran also has around 300,000 men in various militia, paramilitary, and national police forces. These figures seem likely to provide the most accurate picture of Iran's manning levels. USCENTCOM has provided different figures. The regular army is estimated to have around 300,000 actives. The Revolutionary Guards to have a total strength of around 170,000. The Air Force and Air Defense Force are estimated to have 35,500, and the Navy to have 18,000. This gives Iran's land forces a total strength of 470,000 actives.[241]

The IISS estimates that Iran's military forces total 513,000 actives, with about 220,000 conscripts. The regular army has about 325,000 actives, including 220,000 conscripts. The Revolutionary Guards have a total strength of around 125,000, roughly 100,000 of which are assigned to the land branch. The Iranian air force and air defense force have around 45,000, and the IISS reports strength of the air branch of the Revolutionary Guards as part of the land branch, but they may have up to 5,000 men. The regular Iranian Navy is estimated to have 18,000-20,600 men, and the Iranian Naval Guards to total about 20,000 (including 2,000 in IRGC naval air and marine forces). The IISS also estimates that Iran has roughly 200,000 personnel assigned to the Basij (Population Mobilization Army), with about 90,000 full time actives. The law-enforcement

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forces include a total of around 150,000, with more than 40,000 paramilitary Gendarmerie and border guards.[242]

Iranian Military Expenditures

Iran has cut its military expenditures since the Iran-Iraq War, and it has done so in spite of the fact it lost some 40-60% of its holdings of major land weapons during the climatic battles of the war in 1988, and much of its military inventory is becoming obsolete. US government estimates indicate that Iran's real defense spending is now less than one-half of the level it reached during the Iran-Iraq war, but that Iranian military expenditures still average over $4.0 billion a year.

Measured in constant 1997, dollars, Iran's military expenditures peaked in 1986, at a cost of well $15 billion. They dropped from $8.3 billion to $6.8 billion immediately after the cease-fire in the Iran-Iraq War, when Iran clearly made a decision not to try to pay to recoup its losses during that war. They then dropped from $7.2 billion in 1990 to $4.2 billion in 1992 after Iran assessed the degree to which the UN Coalition destroyed much of Iraq's military capability in the Gulf War. They were $5.0 billion in 1993, $4.8 billion in 1994, $3.6 billion in 1995, $3.9 billion in 1996, and $4.7 billion in 1998. Ironically, they rose after the US imposed sanctions in an effort to cut them.[243]

To put such spending levels in context, Egypt's total spending during 1990-1995 averaged around $1.7 to $2.7 billion. Iraq's expenditures averaged around $10 billion during 1988-1991, but no firm recent figures are available. Kuwait's spending reached peaks of $15 billion a year during 1990-1992, but dropped to $3.2 to 3.6 billion from 1993-1995. Turkey has recently spent between $6 billion and $7 billion. The UAE spends around $1.8 to 2.2 billion annually, and Saudi Arabia spends $17.2 to $20 billion.[244]

There are differences of opinion within the US government over the size of these Iranian military expenditures. For example, US intelligence experts felt in 1994 that Iran had spent up to $8 billion on military forces in 1993, while ACDA estimated only $4.9 billion. The CIA issued

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revised estimates in 1995 that stated it could not make accurate conversions of expenditures in Iranian Rials to dollars, but indicated that Iran had reported it had spent 1,785 billion Rials on defense in 1992, including $808 million in hard currency, and 2,507 billion Rials in 1993, including $850 million in hard currency.[245]

The International Institute of Strategic Studies (IISS) has also produced different figures. It estimates that Iran's economic problems and defeat in 1988 reduced Iran's defense spending from $9.9 billion in 1987/88, to $5.8 billion in 1989/90, $3.2 billion in 1990, $5.8 billion in 1991, $1.8-2.3 billion in 1992, $4.86 billion in 1993, $2.3 billion in 1994, $2.5 billion in 1995, $3.6 billion in 1996, $4.7 billion in 1997, $5.8 billion in 1998, $5.7 billion in 1999, and $7.2 billion in 2000.[246]

There is little debate, however, that the average level of Iranian defense spending dropped sharply after the end of the Iran-Iraq War and remains relatively low. At some point in the mid-1980s, Iran chose to make major cuts in its total military spending in spite of the fact that it was still fighting the Iran-Iraq War. The most likely explanation is that it no longer felt that Iraq could succeed in winning the war, but it may also have been unable to sustain the peak level of spending it reached in 1986.

Iranian Arms Transfers

These trends in total military spending inevitably affect Iran's arms imports and military modernization efforts. They help explain why Iran faces major problems in modernizing and expanding its forces, and continues to have problems with interoperability, standardization, and quality. At the same time, declassified US intelligence data on Iranian arms transfers reveal patterns that follow indicate the reasons for Iran's actions are more complex than the economics of Iranian military spending.

- Figure V-2 compares Iranian and Iraqi arms deliveries and shows that Iran faced a far less serious threat after the arms embargo the UN placed on Iraq in mid-1990.
- Figure V-3 shows that Iran seems to have made a strategic decision after its defeat in the Iran-Iraq War not to engage in a major conventional arms build-up and to concentrate on economic development. It then

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made much more serious cuts in its arms buys after the UN's shattering defeat of Iraq in 1991, and could sustain these cuts because Iraq has remained under an arms embargo ever since. Ironically, the US efforts to sanction Iran coincided with the first real rise in Iranian arms deliveries since the end of the Iran-Iraq War.

- Figure V-4 shows that Iran has shows that Iran has made major cuts in its new arms agreements with Russia since 1996, and has increasing had to rely on lower quality suppliers like China.

- Table V-1 shows the trends in Iranian conventional arms transfers relative to those of the rest of the Gulf states. They make it clear that Iran's arms transfers have been very limited by the standards set by the Southern Gulf states. (Graphic comparisons are shown in Chapter V.)

The more detailed patterns in Iranian arms transfers over time reinforce the points made in Figures V-2 to V-3 and Table V-1. During the mid-period in the Iran-Iraq War, Iran was unable to obtain arms from the US, Russia, or the major West European powers – its former major suppliers. It signed only $10 million worth of agreements with the FSU, only made covert arms purchases from the US as part of the Iran-Contra deal, and bought $865 million worth of relatively unsophisticated weapons from the major West European powers. It did, however, buy $3,835 million from other European powers, most in Eastern Europe. It bought $1,845 million from China, and $2m385 from other states. These included large buys of arms from North Korea, and buys of parts and surplus US equipment from Vietnam.[247]

Iran made a major effort to acquire most sophisticated arms from the FSU in the years that followed. It signed $10.2 billion worth of new arms agreements during the four year period between 1987-1990 -- the time between the final years of the Iran-Iraq War and the Gulf War. It signed $2.5 billion worth of agreements with Russia, $3.4 billion with China, $200 million with Western Europe, $2.1 billion with other European states (mostly Eastern Europe), and $2.1 billion with other countries (mostly North Korea). It is also clear that Iran began to concentrate its limited resources on higher quality arms following the end of the Iran-Iraq War, and cut back on the purchases of large amounts of towed artillery, munitions, and low quality weapons it had needed for a war of attrition with Iraq. [248]

Iran's new arms agreements dropped sharply, however, during the four year period following the Gulf War. They totaled only $4.8 billion during 1991-1994.[249] Despite some reports

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of massive Iranian military build-ups, new agreements during 1991-1994 totaled only a quarter of the value of the agreements that Iran had signed during the previous four years. It signed $1.2 billion in new agreements with Russia, but only $400 million with China, $100 million from other European states (mostly Eastern Europe), and $900 million from other countries (mostly North Korea. Iran got no new orders from the US and only $100 million from Western Europe.[250]

It is difficult to discuss trends precisely because some US government reporting only declassifies data for blocks of several years, and these blocks of time are not always comparable. However, the US estimates that Iran signed only $1.3 billion worth of new arms agreements during 1993-1996 -- a period heavily influenced by an economic crisis inside Iran, low oil revenues, and problems in repaying foreign debt. Iran ordered $200 million from Russia, $300 million from China, $100 million with other European states (mostly Eastern Europe), and $600 million from other countries (mostly North Korea).[251] The drop in agreements with Russia reflected both Iran's financial problems and the result of US pressure that had led President Yeltsin not to make major new arms sales to Russia. Iran's new agreements with China and North Korea heavily emphasized missiles and missile production technology.

If one looks at deliveries over the period from 1992-1995, Iran took delivery on a total of $3 billion worth of arms, versus only $1.1 billion worth of new orders. The difference is explained by Iran's large backlog of orders that can take one to five years to deliver. It obtained $1.7 billion worth of arms from Russia, $700 million from China, $100 million from major West European states, $200 million from other European states, and $300 million from other powers.[252]

Iran signed $1.1 billion worth of new arms agreements during 1996-1999 -- a period still heavily influenced by an economic crisis inside Iran, low oil revenues, and problems in repaying foreign debt. Iran ordered only $200 million worth of new arms agreements from Russia, $800 million from China, and $100 million from other countries.[253] The drop in new arms agreements with Russia reflected both Iran's financial problems and the result of US pressures that had led

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President Yeltsin not to make major new arms sales to Iran. Iran's new agreements with China and North Korea heavily emphasized missiles and missile production technology.

Arms deliveries followed a different pattern, again reflecting the delay between orders and deliveries. The US State Department reports that Iran took delivery on $1.6 billion worth of arms in 1991, $859 million in 1992, $1.4 billion in 1993, $390 million in 1994, $330 million in 1995, $350 million in 1996, and $850 million in 1997, as measured in current dollars.[254] Once again, it is interesting to note that Iranian arms import efforts actually *increased* after the US imposed sanctions.

If one looks at the source of deliveries during this period, Russia delivered $700 million worth of arms between 1996 and 1999. This largely reflected the backlog of orders from the period before the US and Russia reached an agreement that Russia would not provide destabilizing transfers of conventional weapons. Iran also took delivery on $700 million worth of arms from China and $300 million from other sources.[255] However, declassified US estimates of new Iranian arms purchases during 1998-1999 do present a statistical problem. If one compares the reporting for two different blocs of time, the difference between the two reporting periods implies that Iran signed a total of $500 million worth of new arms agreements with Russia between 1998 and 1999. Unfortunately, the US data do not explain what Iran bought, or if such statistical differences are even relevant. The reporting on the Iranian order of battle certainly does not indicate any deliveries reflecting such orders.[256]

If one looks at the entire period between 1992 and 1999, Iran signed only $2.2 billion worth of new arms agreements, but took delivery on $$4,700 worth. Iran ordered a total of $400 million in new arms agreements from Russia, $1000 million from China, $500 million with other European states (mostly Eastern Europe), and $300 million from other countries (mostly North Korea). [257]

In short, the overall patterns in Iranian arms transfers reflect what seem to be clear strategic decisions by Iran that it did not have to cripple its economy to buy new arms after its

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defeat by Iraq in 1988, and that it could then afford to make further cuts in arms buys after Iraq's conventional forces were shattered in the Gulf War in 1991. At the same time, Iran was driven to cut its arms buys by severe internal economic problems, and by the fact the US had considerable success in limiting Iran's access to advanced arms from Europe and Russia between 1995 and 1998.

These patterns do not mean that Iran's military efforts were crippled, or that it did not make some important arms buys. Its carefully focused arms purchases as discussed by service in the sections that follow and more broadly in Chapter VII. It is also clear that the effectiveness of the US-Russian agreement to limit arms transfers that was signed in 1995 may be eroding. Most important, such figures on conventional arms transfers do not include the costs of Iran's efforts to proliferate, which are discussed in detail in Chapter IX. Iran seems to have made a strategic decision to emphasize weapons of mass destruction over conventional arms. It is again one of the ironies of US efforts to sanction Iran that Iran increases its expenditures on both proliferation and conventional arms after the Clinton Administration signed Executive Orders sanctioning Iran and the US Congress passed ILSA.

Finally, while Iran has not yet mass-produced any major modern weapons systems domestically – as distinguished from assembled kits of weapons like the T-72 and BMP-1 -- Iran has made major efforts to reduce its dependence on imports. It has also demonstrated a number of key weapons prototypes. These efforts include the following developments:

- Showed prototype of a main battle tank called the Zulfiqar (Zolfaqar) in 1994. Tank has undergone field trials ever since the Velayat military exercises of May 1996. Its drive train and suspension seems to be modeled on the US-designed M-48A5 and M-60A1 series of tanks and to have either a 105 mm or 125mm rifled gun. Reports differ as to the Zulfiqar's production status. One report indicates that Iran announced on July 8, 1997, that President Rafsanjani opened the "first phase" of a plant to produce the tank in Dorud, some 300 kilometers southwest of Tehran. Another report indicates that it will be produced at the Shahdid Industrial Complex.

- Claims ready to produce light tank for "unconventional warfare" called the Towan (Wild Horse) with 90 mm gun.

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- Developed Iranian-made modification of the Chinese Type WZ 501/503 armored infantry fighting vehicle which Iran calls the Boragh. The WZ 501/503 is itself a Chinese copy of the Russian BMP, and is 30 year old technology.

- Displayed APC called the Cobra or BMT--2, which seems to be an indigenous design armed with a 30 mm gun or the ZU-23-2 anti-aircraft gun -- a light automatic weapons system that Iran has been manufacturing for some years. Like the Zulfiqar, the Cobra has been undergoing field trials in Iranian military exercises since May 1996.

- Produces a copy of the Russian AT-3 9M14M (Sagger or Ra'ad) anti-tank guided missile.

- Claimed in May 1996, to have produced a self-propelled version of a Russian 122 mm gun that it called the Thunder-1, with a firing range of 15,200 meters and a road speed of 65 kilometers per hour.[258]

- Makes military radios and low-technology RPVs like the 22006, Baz, and Shahin.

- Claims to have built its first Iranian-designed helicopter, and to have tested a locally-built fighter plane. Brigadier General Arasteh, a deputy head of the General Staff of the Armed Forces (serving under Major General Ali Shahbazi, the joint chief of staff) stated in April, 1997 that the "production line of this aircraft will begin work in the near future."

- Defense Industries Organization has claimed that Iran was soon going to start producing two trainers, a jet-powered Dorna (Lark) and propeller-driven Partsu (Swallow).

- Iranian military has claimed that Iran has begun mass production of a jet strike aircraft, the Azarakhsh (Lightning), which reportedly resembles the F-4 Phantom (JDW 4 November 1998: 20). Iran has reportedly developed a TV-guided missile for carriage on F-4 Phantoms

- Iran claims to have deployed an air-to-air adapted variant of the SM1 Standard missile for its fleet of F-4D/E Phantom II fighter bombers. (JDW 29 April 1998: 17)

- President Rafsanjani announced on October 11, 1997, that Iran had test-launched a major new surface-to-air missile system with a range of 250 kilometers, although he gave no further details. The description of the missile sounded vaguely like the Russian SA-5, which is deployed in Iran. Reports Iran has acquired four HQ-23/2B (CSA-1) launchers and 45-48 missiles, plus 25 SA-6, and 10-15 SA-5 launchers.

- Claims to produce advanced electronic warfare systems.

- Claims will soon start producing 6 multi-purpose destroyers, with initial production run of three.

- Iran claims to be developing non-magnetic, acoustic, free-floating and remote controlled mines. It may have also acquired non-magnetic mines, influence mines and mines with sophisticated timing devices.

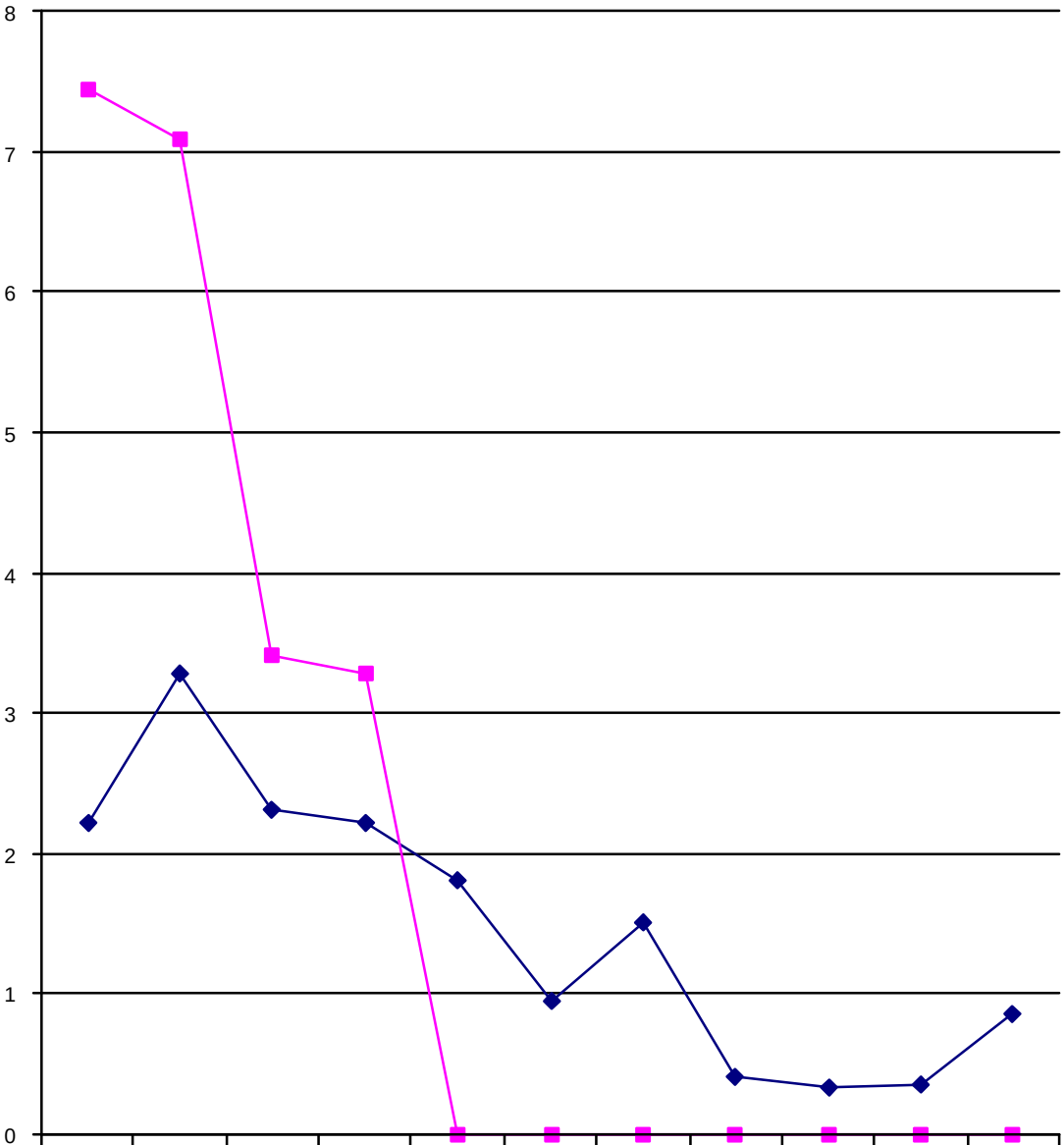
- Iran is developing FL-10 anti-ship cruise missile that is copy of Chinese FL-2 or FL-7.

- Reportedly assembled domestic variants the YJ-1 (C-801) solid-propellant anti-ship missile under the local name of Karus, and the YJ-2 (C-802) turbojet-powered anti-ship missile under the local name of Tondar (JDW 9 December 1998)

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Figure V-2

Iran Reacts to the Threat: Decline in Iranian and Iraqi New Arms Deliveries
(In Constant 1997 $US billions)



	87	88	89	90	91	92	93	94	95	96	97
Iran	2.221	3.286	2.312	2.225	1.812	0.942	1.512	0.412	0.342	0.356	0.85
Iraq	7.448	7.078	3.407	3.279	0	0	0	0	0	0	0

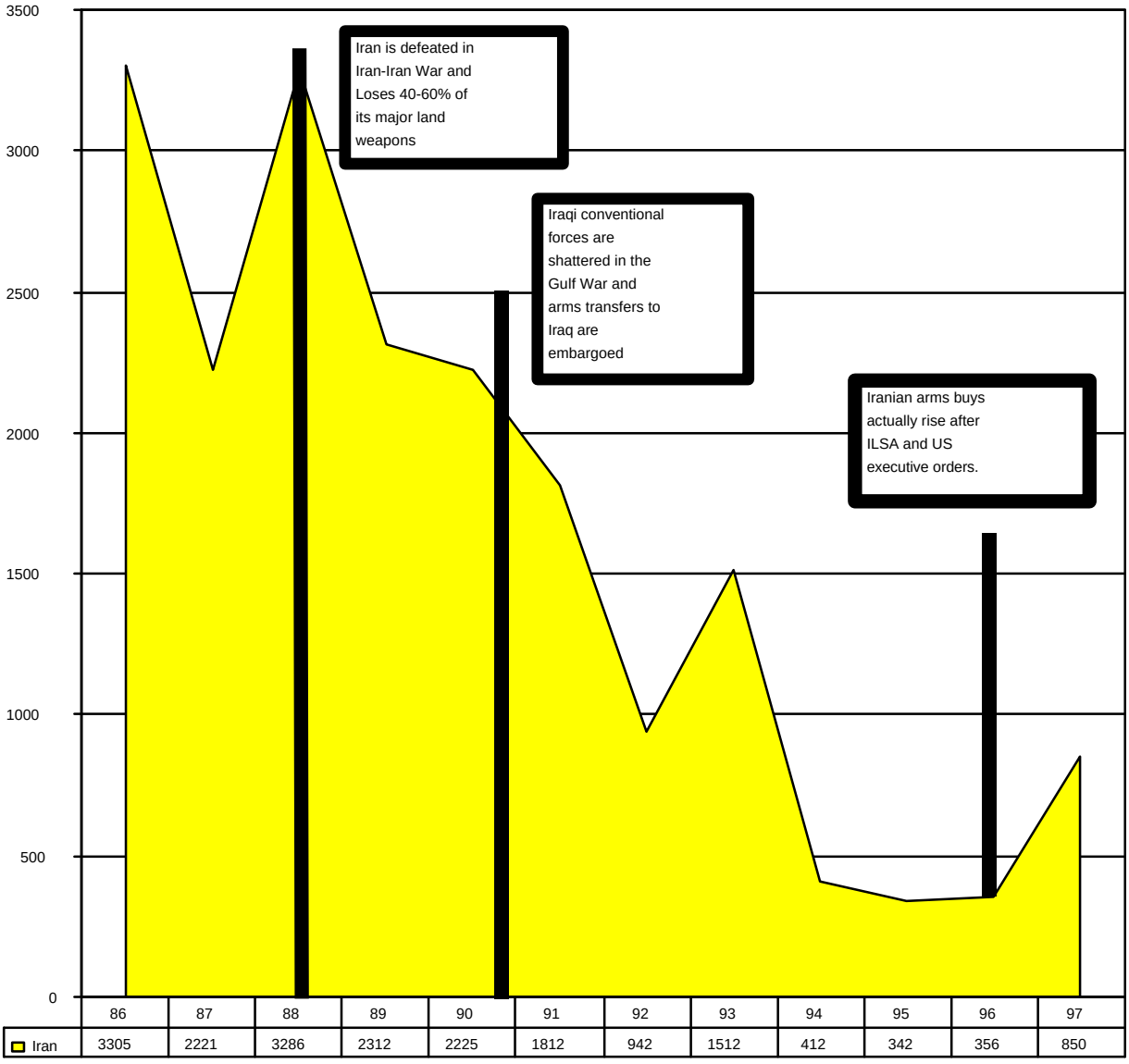
Source: Adapted by Anthony H. Cordesman from ACDA database for Table IIIA in State Department Bureau of Arms Control World Military Expenditure and Arms Transfers report.

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Figure V-3

Cumulative Arms Imports of Iran - 1984-1997

(Value of Deliveries in Constant $1997 Millions)



	86	87	88	89	90	91	92	93	94	95	96	97
Iran	3305	2221	3286	2312	2225	1812	942	1512	412	342	356	850

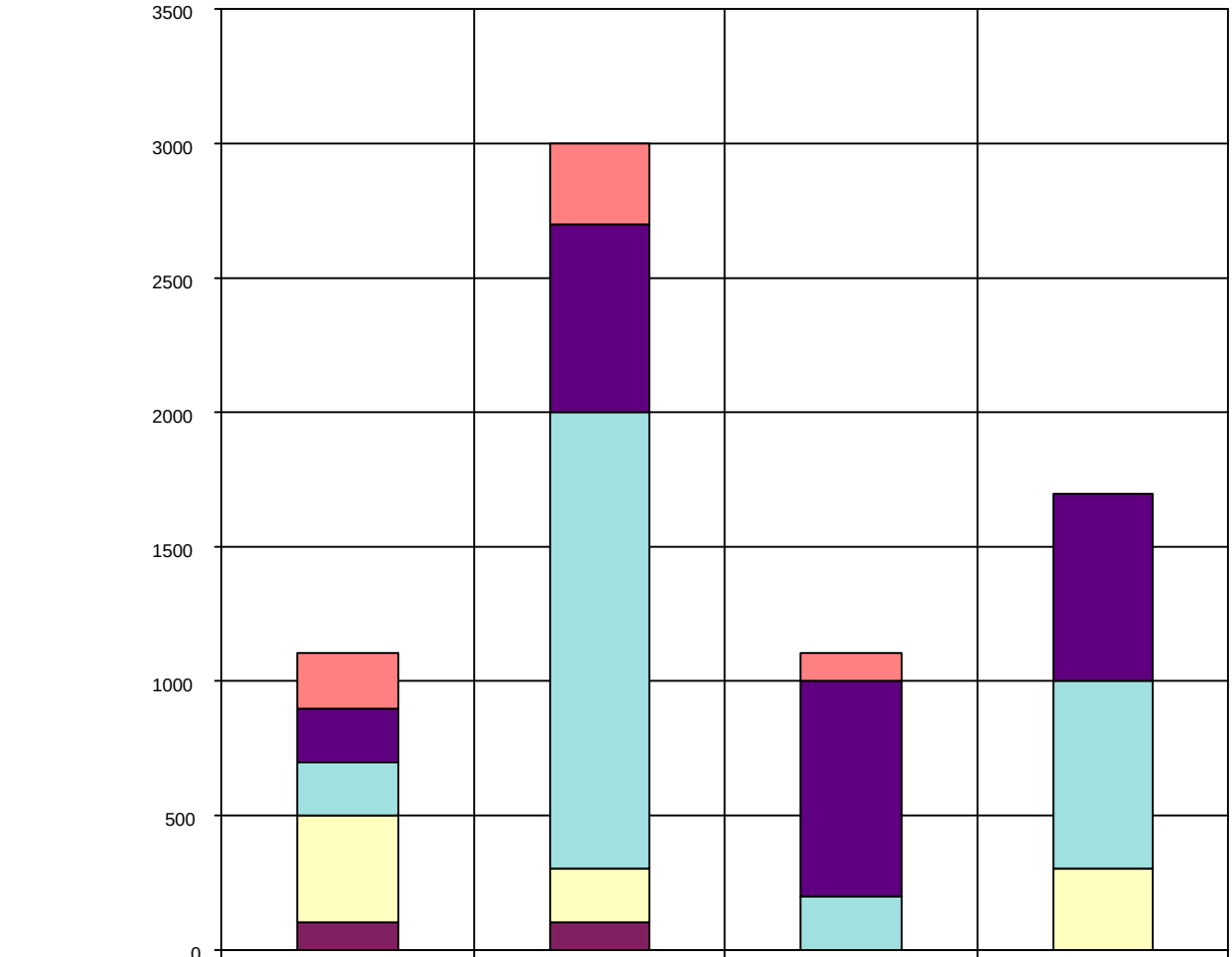
Source: Adapted by Anthony H. Cordesman from US Arms Control and Disarmament Agency, World Military Expenditures and Arms Transfers, GPO, Washington, various editions.

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Figure V-4

Major Supplier Share of Total Iranian New Arms Agreements and Deliveries: 1996-1999

($Current US Billions)



	New Agreements: 92-95	Deliveries:92-95	New Agreements: 96-99	New Deliveries: 96-99
All Others	200	300	100	0
China	200	700	800	700
Russia	200	1700	200	700
All Other Europe	400	200	0	300
Major West Europe	100	100	0	0
US	0	0	0	0

0 = less than $50 million or nil, and all data rounded to the nearest $100 million.
Source: Richard F. Grimmett, Conventional Arms Transfers to the Developing Nations, Congressional Research Service, various editions.

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Table V-1

Gulf Arms Buys by Supplier: 1987-1999

(New arms agreements in current US $millions)

Buyer Country	Supplier Country						
	US	Russia	China	Major West European	Other European	All Others	Total
Iran							
1987-90	0	3,500	2,300	200	1,200	1,600	8,800
1991-94	0	200	200	100	100	600	1,200
1995-98	0	200	800	0	300	100	1,400
1996-99	0	200	800	0	100	0	1,100
Iraq							
1987-90	0	300	700	500	500	1,000	3,000
1991-94	0	0	0	0	0	0	0
1995-98	0	0	0	0	0	0	0
1996-99	0	0	0	0	0	0	0
Bahrain							
1987-90	300	0	0	0	0	0	300
1991-94	200	0	0	0	0	0	200
1995-98	500	0	0	0	0	0	500
1996-99	500	0	0	0	0	0	500
Kuwait							
1987-90	2,500	200	0	200	200	200	3,300
1991-94	3,500	800	0	1,800	0	100	6,200
1995-98	900	0	200	700	100	0	1,900
1996-99	800	0	200	100	0	0	1,100
Oman							
1987-90	100	0	0	600	0	0	700
1991-94	0	0	0	500	0	100	600
1995-98	0	0	0	300	100	100	500
1996-99	0	0	0	300	100	0	400
Qatar							
1987-90	0	0	0	0	0	0	0
1991-94	0	0	0	2,000	0	0	2,000
1995-98	0	0	0	900	0	0	900
1996-99	0	0	0	800	0	0	800
Saudi Arabia							
1987-90	18,800	200	300	23,000	2,300	200	44,800
1991-94	15,600	0	0	6,600	100	0	22,300
1995-98	5,100	0	0	1,700	800	300	7,900
1996-99	5,500	0	0	400	900	300	7,100
UAE							
1987-90	300	0	0	300	0	400	1,000
1991-94	300	500	0	3,900	100	0	4,800
1995-98	100	400	0	6,000	800	100	7,400
1996-99	300	400	0	6,000	800	200	7,700

0 = less than $50 million or nil, and all data rounded to the nearest $100 million.
Source: Richard F. Grimmett, Conventional Arms Transfers to the Developing Nations, Congressional Research Service, various editions.

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The Iranian Army

The Iranian regular army had a strength of around 325,000 full time actives in 2000, including around 220,000 conscripts. It had some 12 division equivalents, and around 42-45 maneuver brigades. These formations included four "armored" divisions (two with three brigades and two with four brigades), and six-seven infantry divisions: [259] The lighter and smaller formations in the regular army included the 23rd Special Forces Division, which was formed in 1993-1994, and the 55th paratroop division. According to one source, the 23rd Special Forces Division has 5,000 full-time regulars, and one of the few fully professional units in the Iranian Army. The airborne and special forces are trained at a facility in Shiraz.[260]

The regular army also has a number of independent brigades and groups. These include some small armored units, 1 infantry brigade, 1 airborne and 2-3 special forces brigades, coastal defense units, a growing number of air defense groups, 5 artillery brigades/regiments, 4-6 army aviation units, and a growing number of logistic and supply formations. The land forces have six major garrisons and 13 major casernes.

Most of the combat forces of the Iranian army are normally deployed in three army-sized formations and a smaller corps-sized formation located north to south along the border with Iraq. Iran seems to have been able to move some units away from the south-western border since 1991, as Iraq has concentrated its forces to deal with the domestic threat posed by its Shi'ites in the south and Kurds in the north, but tensions between the Iranian government and the Kurds have forced Iran to maintain strong forces in the northwest.

Iran has slowly rebuilt its armored strength since the Iran-Iraq War. Iran may have had a few as 500 operational main battle tanks after its defeats in 1988. It seems to have rebuilt to an inventory of 1,250 main battle tanks in early 1995. It received enough deliveries to raise this total to over 1,300 operational tanks by January, 1996, and then to around 1,345-1,390 tanks by early 2000. This total compares with around 2,700 tanks for Iraq and 710-1,055 for Saudi Arabia. [261] The IISS has a lower estimate of 1,135 main battle tanks, including 500 T-54/T-55s, PRC T-59s;

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75 T-62s, 120 T-72s, 140 Chieftain Mark 3/5s; 150 M-47/M-48s, 150 M-60A1s, and some Iranian produced Zulfiqars. These figures do not, however, seem to include 100 T-72 tank kits that are reported to have been delivered to Iran in 1998.[262]

In any case, Iran's total main battle tank holdings are only sufficient to fully equip 5 to 7 of its divisions by Western standards, and Iran could only sustain about half this force for even a weak of extended maneuver warfare. At present, many are dispersed in relatively small lots among all of its regular Army and some of its IRGC combat units. Most of the IRGC units still only have small tank force cadres and it is unclear how heavy IRGC forces become in the future. The 92nd Armored Division is the only Iranian division that has enough tanks to be a true armored division, even by regional standards.

Iran seems to have about 1,000-1,360 armored infantry fighting vehicles (AFVs) and armored personnel carriers (APCs) in its operational inventory, although counts are contradictory and it is difficult to estimate what parts of Iran's holdings are fully operational and/or sustainable for any length of time in combat. The IISS, for example, estimates a total of 545 light tanks and armored infantry fighting vehicles, and 550 APCs. Virtually all estimates indicate, however, that Iran has less than half of the total holdings of such armored vehicles it needs to fully mechanize its forces.[263] This total compares with around 3,800 such weapons for Iraq and 3,000-3,600 for Saudi Arabia. Iran does, however, have more than 300 BMP-1s and 140 BMP-2 equivalents, and at least 35 EE-9 Cascavel armored reconnaissance vehicles.264 Another 100 BMP-2 kits seem to have been delivered in 1998.

It is difficult to interpret the unclassified data available on Iranian armored operations, but Iran's armored warfare doctrine seems to be borrowed from US, British, and Russian sources without achieving any coherent concept of operations. Even so, Iran's armored doctrine is improving more quickly than its organization and exercise performance. Iran's armored forces are very poorly structured, and Iran's equipment pool is dissipated among far too many regular and IRGC units.

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Iran seems to practice the kind of armored combat that might be effective against Iraq, but its exercises are slow-moving, and emphasize daytime and short to medium-range engagements. Many are highly notional and do not involve large-scale actual movements. The movements that do take place have a preplanned, set-piece character. The tactics practices also seem to be more effective in relatively static defensive operations and limited, local counter-attack modes than in training for longer range defensive maneuvers or offensive operations. Only a few of Iran's heavy combat brigades seem to have made real efforts to improve their combined arms operations, and conduct joint operations with airborne and air units. Nevertheless, Iran's doctrine has become steadily more realistic and contemporary with Western and Russian doctrine. The emphasis on massed infantry, "popular armies," and "revolutionary forces" that crippled Iran's armored development during the Iran-Iraq War seems to have sharply diminished even before the Iran-Iraq leak ended.[265]

Iran has large holdings of anti-tank guided weapons and has been manufacturing copies of Soviet-systems, while buying missiles from China, Russia, and the Ukraine. It has approximately 80-100 TOW and 20-30 Dragon anti-tank guided missile launchers that were originally supplied by the US, although the operational status of such systems is uncertain. It has introduced Soviet and Asian versions of the AT-2, AT-3, and possibly the AT-4 into its forces. Iran seems to have at least 100-200 AT-4 (9K111) launchers, but it is impossible to make an accurate estimate because Iran is producing its own copies of the AT-3.[266] Iran also has roughly 750 RPG-7V, RPG-11, and 3.5" rocket launchers, and roughly 150 M-18 57 mm, 200 M-20 75 mm and B-10

Iran had some 3,000-3,400 operational medium and heavy artillery weapons and multiple rocket launchers in early 2000. This total compares with around 2,000 weapons for Iraq and 500 for Saudi Arabia. These high numbers reflect Iran's continuing effort to build-up artillery strength that began during the Iran-Iraq War when Iran used artillery to support its infantry and Islamic Revolutionary Guards Corps in their attacks on Iraqi forces. Iran's holdings of self-propelled weapons still appear to include a substantial number of US-supplied systems, including 25-35 M-110 203 mm howitzers, 20-30 M-107 175 mm guns, and 150-160 M-109 155 mm howitzers. Iran

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also has 90-100 Austrian GHN-45 155 mm towed gun/howitzers, and 1,000-1,150 North Korean, Chinese, and Soviet M-46 and Type 59-1 towed 130 mm guns; and 550 Soviet, North Korean, Polish, and Czech D-30 122 mm gun-howitzers. Its holding include 30-35 D-20 towed 152 mm howitzers, 100 People's Republic of China 122 mm towed howitzers, and other former Soviet bloc, PRC, and North Korean towed weapons. Iran has 700-900 multiple rocket launchers, although a number may no longer be in service or may be assigned to low-grade IRGC forces.[267]

Iran's artillery organization, doctrine, training, and equipment are obsolescent by Western standards. Iran had to use artillery as a substitute for armor and air power during much of the Iran-Iraq War, and generally used relatively static massed fires. While some regular army units used artillery more flexibly, Iran artillery tended to pound away at area targets and often with little success. Iranian forces showed little skill at targeting and often missed Iraqi concentrations or continued to fire at heavily sheltered Iraqi forces. Iran's limited and largely obsolete artillery fire control system had serious problems in massing fires suddenly against an area, and in altering range to properly support even slow-moving infantry advances. This problem was further complicated by poor coordination between the regular forces and the IRGC.

Iran's reliance on towed artillery still limits Iran's combined arms maneuver capabilities, and Iran has failed to develop effective night and beyond-visual-range targeting capability. This helps explain why Iranian artillery did a consistently miserable job of targeting and striking Iraqi rear areas -- although it often inflicted serious damage on settled areas and towns -- and could not effectively engage once Iranian and Iraqi forces came into close proximity. It was also highly vulnerable to suppression by Iraqi chemical weapons. Little has changed since the Iran-Iraq war and much of Iran's artillery fire is relatively ineffective and/or is limited to the ability to deliver harassment and interdiction fire that has limited impact on modern maneuver forces.

The Iranian land forces have a total of some 1,700 anti-aircraft guns, including 14.5 mm ZPU-2/4s, 23 mm ZSU-23-4s and ZU-23s, 35 mm M-1939s, 37 mm Type 55s, and 57 mm ZSU-57-2s.[268] Iran also has 100-180 Bofors L/70 40 mm guns, and moderate numbers of Skyguard 35

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mm twin anti-aircraft guns (many of which may not be operational). Their largest holdings consist of unguided ZU-23-2s (which it can manufacture) and M-1939s. They also have large numbers of SA-7 (Strela 2M) manportable surface-to-air missiles, and a growing number of SA-14 (Strela) manportable surface-to-air missiles. Iran also has some RBS-70 low-level surface-to-air missiles and large numbers of HN-5 manportable surface-to-air missiles.

Iranian operational helicopter holdings are uncertain. USCENTCOM reports a total of about 300 helicopters.[269] According to the IISS and Jane's, the Iranian Army retains 100-110 AH-1J Sea Cobra attack helicopters, and 36-40 CH-47C, 110-130 Bell-214A, 30-35 AB-214C, 35-40 AB-205A, 80-90 AB-206, 12 AB-212, 27-30 Bell 204, 5 Hughes 300C, 9 RH-53D, 10 SH-53D, 10 SA-319, and 40-45 UH-1H transport and support helicopters supplied by the West. Many experts agree, however, that Iran has a maximum of 60-80 operational AH-1s, that Iran's Western-supplied transport and support helicopters have low operational readiness -- perhaps as low as 35%-65% of inventory -- and that its helicopter forces have little sustained sortie capability.

The exercise performance of Iran's land forces has slowly improved since 1988, both in dealing with maneuver warfare threats like Iraq, and with the defense of Iran's coastline. It has emphasized more modern concepts of combined operations and has sought to give its artillery more maneuver capability. Its artillery doctrine is now somewhat more modern and comparable to that of modern Western and Russian forces, although it still has serious conceptual problems in dealing with the need for more precise targeting, the rapid massing of fires, fighting night combat, and dealing with targets in rears areas. The limited data available also indicate that Iran may sharply over-estimate the lethality of artillery against most types of targets.

At the same time, Iran is scarcely capable of rapid, fluid armored maneuver operations, and much of its exercise activity still has a set piece character that constantly announces unearned and untested successes, rather than realistically stressing and testing combat unit performance. Counterbattery capabilities also seem to continue to lag, and either lack adequate targeting or fire

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control systems or depend on systems that may be relatively easy to target or counter. Iran's performance may be adequate by the generally low standards of Iraq and most Southern Gulf forces, but lags far behind the level of US and the better Western forces.

The Islamic Revolutionary Guards Corps (Pasdaran) [270]

US experts believe that the IRGC have a total manning of around 120,000-125,000, of which roughly 100,000 men were in the land forces. This manpower draws heavily on conscripts chosen from the same pool as all other conscripts, without special selection as to education or ideological loyalty. It is not surprising, therefore, that over 70% of the IRGC voted for Khatami -- although important elements within the IRGC are largely career professionals and some units with internal security functions are screened for ideology and loyalty.

Unlike the regular army, which is organized as a national force, the IRGC is organized primarily along territorial lines. The IRGC was organized into eleven internal security regions, with most of its military/paramilitary forces assigned to conventional military and internal security missions. Some reports credit the IRGC with very high numbers of major units. One source quotes a strength of 15-20 "divisions".[271] Another source refers to a build-up that was completed in 1993, and a strength of 11 regional headquarters (fully manned), two mobilizable armored divisions, and 24 cadre strength infantry divisions.[272]

The most probable estimate of the organization of the IRGC is that its units include 13 infantry "divisions," two armored "divisions," and a large number of independent infantry, airborne, special forces, armored, surface-to-surface missile, artillery, engineer, border, and air defense units -- many of which were called brigades. This large order of battle, however, would require over 250,000 men to fully man and sustain divisions that were kept as small as 10,000 actives. In practice, the IRGC should be regarded as having a total force of about 15 small combat units, only a few of which are armed well enough to be regarded as anything other than light infantry, plus a number of independent formations. These units normally have a total manning equivalent to large battalions.[273]

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Various leaders of the IRGC have called for more armored forces, including large numbers of T-72s. Most IRGC land forces remain light infantry forces, however, and the IRGC is only slowly being upgraded. The IRGC has set the goal of creating mechanized “divisions,” but none have yet emerged and experts have different views regarding the extent to which the IRGC will or will not establish heavy formations that parallel those of the regular army.

During the last few years, the IRGC has gotten nearly 50% of Iran’s imports of advanced land weapons, including such key systems as T-72s and BMPs. These deliveries have been limited, however, and the IRGC tends to disperse them in small, ineffective lots throughout the IRGC’s main combat units. As a result, it will be some years before even the best IRGC units can rival the regular forces in firepower and maneuver capability unless radical changes are made in the allocation of Iran’s weapons.

The IRGC has a large component trained for covert operations and unconventional warfare. Roughly 5,000 of the men in the IRGC are assigned to the unconventional warfare mission. The IRGC has the equivalent of one special forces “division,” plus additional smaller formations, and these forces are given special priority in terms of training and equipment. In addition, the IRGC has a special Quds force which plays a major role in giving Iran the ability to conduct unconventional warfare overseas using various foreign movements as proxies.[274]

As has been noted earlier, there is no way to separate the equipment holdings of the regular army and the IRGC. It is clear, however, that it is the regular army which operates most of Iran’s heavy weaponry, although the armored elements of the IRGC are slowly expanding and some have T-72s and armored fighting vehicles. Other IRGC units, with T-54 tanks, are reported to be upgrading their tanks with T-72 engines and laser range finders.

Like the Iranian Army, the IRGC possesses numerous anti-tank weapons, including Dragon, TOW, and AT-3 ATGMs, 3.5" rockets, and RPG-7s. It also has about 1,500 air defense guns, large numbers of small and man-portable surface-to-air missiles, and increasing numbers of the

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HN-5 light surface-to-air missiles. Iran's holdings of such weapons are uncertain, but it seems to be importing both Chinese and Russian short-range air defense missiles.[275]

The IRGC seems to be the principle operator of Iran's land-based surface-to-surface missile forces. Both the Iranian regular army and IRGC have offensive and defensive chemical warfare capabilities, but the IRGC seems to have custody of most of these weapons and to provide the military supervision for related research, development, and production activities. Such activities cannot be separated, however, from the IRGC role in other military industry and development activities.

It is extremely difficult to estimate the proficiency of IRGC units. It seems likely, however, that quality varies sharply by unit and that only a portion of the IRGC land forces are intended to participate in joint operations with the regular army in regular combat. These forces seem to have improved steadily in their training, organization, and discipline since the early 1990s, and have also expanded their joint training with the regular army, navy, and air force. Exercises in 1996 and 1997 have shown that the IRGC can support the army and navy in exercises designed to demonstrate Iran’s ability to threaten shipping traffic and combat ships in the Gulf, defend Iran’s offshore islands and facilities, deal with surprise attacks by the US, defend the border with Iraq, and close the Afghan border.[276]

The Iranian Air Force

The Iranian air force has built back to a total active inventory of around 260-300 combat aircraft, some 50-60% of which are really operational. The Air Force also has an independent surface-to-surface missile brigade. The air force and air defense force had a strength of about 40,000-50,000 men, with 15,000-20,000 men in the air force plus 12,000-15,000 more in the land-based air defense forces. The Iranian air force is scarcely the dominant regional force that the Shah sought to create before his fall.

A comparison of estimates by the IISS and other sources indicates that the air force had 18 main combat squadrons in 2000. These included nine fighter ground-attack squadrons, with

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4/50-66 US-supplied F-4D/E and 4/55-60 F-5E/FII, and 1/24-30 Soviet -supplied Su-24. Iran had seven air defense squadrons, with 4/25-30 US-supplied F-14, 2/27-30 Russian/Iraqi-supplied MiG-29, and 1/25-35 Chinese supplied F-7M (in the Revolutionary Guards with up to 14 more in the process of delivery).[277] According to some reports, Iran has modified its Standard SM-1 anti-ship missiles so they can be delivered by its F-4Es.[278]

Most Iranian squadrons can perform basic air defense and attack missions, regardless of their principal mission -- although this was not true of Iran's F-14 (air defense) and Su-24s (strike/attack) units. Iran's F-14s have not been able to use their Phoenix air-to-air missiles since the early 1980s. Iran has claimed that it is modernizing its F-14s by equipping them with I-Hawk missiles adapted to the air-to-air role, but it is far from clear that this is the case or that such adaptations can have more than limited effectiveness. [279]

The Iranian air force has a small reconnaissance squadron with 3-8 operational RF-4Es, and possibly 5-10 additional RF-5EII. The air force has 1 RC-130 and other intelligence/reconnaissance aircraft. Iran also had 15-20 F-5B and F-5FII, 5-15 FT-7, and 7 T-33 armed training aircraft. Many of these trainers are combat-capable, although their operational status is unclear.[280]

Iran has moderate airlift capabilities for a regional power. The Iranian air force's air transport assets included one tanker/transport squadron with 3 B-707s and one B-747, and five transport squadrons with 6 B-747Fs, 1 B-727, 16-18 C-130E/Hs, 3 Commander 690s, 12-15 F-27s, and 3-5 Falcon 20As. Its helicopter strength includes 2 AB-206As, 34-39 Bell 214Cs, and 3-4 CH-47 transport helicopters. As has been discussed earlier, the bulk of Iran's rotary wing assets are assigned to the land forces.

The IRGC also has some air elements, including Chinese-made F-7 fighters, and its air branch has had an independent commander since 1992.[281]

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In spite of Iran's efforts, the readiness and force quality of its air force remain major issues. The Iranian air force still has many qualitative weaknesses, and it is far from clear that its current rate of modernization can offset the aging of its Western-supplied aircraft and the qualitative improvements in US and Southern Gulf forces. The air force also faces serious problems in terms of sustainment, command and control, and training.

These are not new problems. The Iranian air force largely collapsed as a fighting force during the first two years of the Iran-Iraq War because of the lack of Western support and resupply. An estimate by the US Office of Naval Intelligence in 1996 indicated that Iran had only 175 operational combat aircraft. Roughly 44% of these aircraft were "second generation" aircraft like the Chinese F-7 and US F-5, 22% were "third generation" aircraft like the F-4 and F-14, and 34% were "fourth generation" aircraft like the Su-24 and MiG-29. The same estimate indicated that Iran's operational strength had only increased from 150 aircraft in 1985 to 175 in 1995, and that Iran's strength would drop to 125 aircraft in 2005.[282]

The Iranian air force must also deal with the fact that its primary challenge now consists of the US and Saudi air forces, rather than a typical Third World air force like Iraq's. The US and Saudi air forces are high technology air forces that operate the AWACS airborne control system, have some of the most advanced electronic warfare and targeting systems in the world, and have full refueling capability. They use sophisticated, computer-aided aggressor training and have all of the range and training facilities for beyond-visual-range combat and stand-off attacks with air-to-surface munitions.

Iran has no airborne control system, although it may be able to use the radars on its F-14s to support other aircraft from the rear. Its overall C^4I system is a totally inadequate mix of different sensors, communications, and data processing systems. It has limited electronic warfare capabilities by US standards, although it may be seeking to acquire two Beriev A-50 Mainstay AEW aircraft, and has converted some aircraft to provide a limited ELINT/SIGINT capability. It has limited refueling capabilities, lacks advanced training facilities, and has only limited capability

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to conduct realistic training for beyond-visual-range combat and stand-off attacks with air-to-surface munitions.

Iranian Ground-Based Air Defenses

Iran has assigned about 15,000-20,000 men to land-based air defense functions, including at least 8,000 regulars and 4,000 regular IRGC personnel. It is not possible to distinguish clearly between the major air defense weapons holdings of the regular air force and IRGC, but the air force appeared to operate most major surface-to-air missile systems. Iran's land-based air defenses is shown in Table Eight, and total holdings seem to include 30 Improved Hawk fire units (12-16 battalions/100+ launchers), 45-55 SA-2/HQ-2J/23 (CSA-1) launchers (Chinese-made equivalents of the SA-2), and possibly 25 SA-6 launchers. The force also had three Soviet-made long-range SA-5 units with a total of 10-15 launchers -- enough for six sites.

Iran's holdings of lighter air defense weapons included five Rapier squadrons with 30 Rapier fire units, 5-10 Chinese FM-80 launchers, 10-15 Tigercat fire units, and a few RBS-70s. Iran also hold large numbers of man-portable SA-7s, HN-5s, and SA-14s, plus about 2,000 anti-aircraft guns -- including some Vulcans and 50-60 radar-guided and self propelled ZSU-23-4 weapons.[283].

Iran's air defense forces have steadily increased the number of surface-to-air missile sites along the Gulf coast and on islands in the Gulf. Iran had only three major (Hawk, SA-6, SA-5) missile sites in 1992. It had ten to twelve major sites by 1997, although these sites are still too widely spaced to provide more than limited air defense for key bases and facilities, and many lack the missile launcher strength to be fully effective. This is particularly true of Iran's SA-5 sites, which provide long-range medium-to-high altitude coverage of key coastal installations. Too few launchers are scattered over too wide an area to prevent relatively rapid suppression.[284]

Iran also lacks the low altitude radar coverage, overall radar net, command and control assets, sensors, resistance to sophisticated jamming and electronic countermeasures, and systems integration capability necessary to create an effective air defense net. Its land-based air defenses

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must operate largely in the point defense mode, and Iran lacks the battle management systems and data links are not fast and effective enough to allow it to take maximum advantage of the overlapping coverage of some of its missile systems -- a problem further complicated by the problems in trying to net different systems supplied by Britain, China, Russia, and the US. Iran's missiles and sensors are most effective at high-to-medium altitudes against aircraft with limited penetrating and jamming capability.

Iran's Naval Forces

Iran's regular Navy, the naval elements of the Islamic Revolutionary Guards Corps, and the Iranian marines total around 38,000 men -- with about 18,000 regulars and 17,000-20,000 men in the Iranian Naval Revolutionary Guard forces. These forces are organized into two fleets.[285] While some sources list Iran as having three Marine Brigades, USCENTCOM estimates a total strength of only three Marine battalions. It is not clear how these marine units are structured, trained, or equipped.[286]

There are significant differences among experts, as to how to classify given ships and count Iran's naval order of battle. US experts now have dropped Iran's destroyers from its operational order of battle, and feel that only five of Iran's Combattante II (Karman-class) fast attack boats have been modernized to carry two to four C-802 Chinese anti-ship missiles. They indicate that Iran has a total of about 20 missile patrol craft. IISS estimates gave Iran a total of 3 frigates, 2 corvettes, 20 missile combatants, 3 large patrol ships, 38 inshore patrol boats, 5-7 mine warfare ships (including one training ship), 8-9 amphibious ships, 10 amphibious craft, 9 large auxiliary ships, and roughly 32 smaller auxiliary ships. Iran had 14 hovercraft, but these may no longer be operational. The IISS estimates that Iran's naval air units had 5 aging P-3F 5 Do-228 and maritime patrol aircraft, 14 SH-3D and 6 AB-212 ASW helicopters, 9 RH-53D mine countermeasure helicopters, transports, and around 20 support helicopters.

Other sources have previously counted more ships as operational, and some estimate that all of Iran's Combattante Is have been modernized to carry Chinese anti-ship missiles by the end

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of 1997. Unclassified USCENTCOM estimates have shown a total of 3 destroyers, 3 Kilo-class submarines, 2 PF-103 corvettes, 8 fast patrol boats, 7 large patrol boats, 3 minesweepers, 11 landing ships and craft, 4 logistical support ships, 2 BH-7 hovercraft, 11 fixed-wing aircraft, and 19 helicopters. The IISS and Jane's still indicate that Iran's destroyers are operational. According to other estimates, Iran's operational inventory includes 3 submarines, 2 destroyers, 3 frigates, 2 corvettes, and 25-30 missile combatants. [287]

Iran has support ships, but these are generally insufficient to sustain "blue water" operations and support an amphibious task force. It has one Kharg-class 33,014 ton replenishment ship, two Bandar Abbas-class 4,673 ton fleet supply ships and oilers, one 14,410 ton repair ship, two 12,000 ton water tankers, seven 1,300 ton Delva-class support ships, 5-6 Hendijan-class support vessels, two floating dry-docks and 20 tugs, tenders, and utility craft to help support a large naval or amphibious operation.

Iran has large numbers (20,000?) of naval Revolutionary Guards. They operate the 5-7 Seersucker (HY-2) anti-ship missile sites Iran used to defend its ports and cover the Straits of Hormuz, plus a large number of smaller anti-ship missile sites on its coast and islands, and a number of shelters and dispersal sites to which it could rapidly deploy missiles in a crisis. While it is impossible to distinguish precisely between the IRGC's holdings of small craft and those of the regular navy, the IRGC seemed to operate large numbers of Peterson PBI coastal patrol craft, at least 6 other inshore patrol craft, some 30 Boghammer patrol boats, several hovercraft, some hovercraft, about 30 craft somewhat similar to the Boston Whaler, and large numbers of small boats similar to River Roadstead patrol craft.

Much of the regular navy is based at Bandar Abbas, the only large Iranian port far enough away from Iraq to be relatively secure from Iraqi air attack during the Iran-Iraq War. This port is the home of Iran's destroyers, frigates, and two Kilo-class submarines. Iran does not conduct extensive patrols in the Gulf of Oman, but does hold occasional exercises there, and is expanding its base at Chah Bahar in the Gulf of Oman. Iran has another large naval base at Bushehr, where it

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deploys most of its guided missile patrol boats. It has operated hovercraft forces out of the oil port at Kharg Island since the time of the Shah, and has a moderate force at its Western port of Bandar Khomeini, which covers the waters opposite Iraq and the entrance to the Shatt al-Arab. It has small bases at Bandar e-Anzali and Noshahr on the Caspian. Noshahr is used for training Islamic Revolutionary Guards Corps forces in unconventional warfare.[288]

Opinions differ as to how much of Iran's surface force is fully operational. Iran is clearly able to operate some of its British-made Sa'am-class fast attack craft. According to some reports, it can also operate most of the weapons systems on at least two frigates, one to two corvettes, missile six to ten fast attack craft (FAC), three large patrol boats and 28 coastal patrol boats, and most of its amphibious ships and logistics ships. Many of these ships have effective anti-ship missiles, although their air defense systems and electronic warfare, and radar capabilities are weak.[289]

Both the Iranian Navy and the naval branch of the IRGC have a capability for mine warfare. While Iran has only a limited number of specialized mine vessels, it can also use small craft, LSTs, Boghammers, helicopters, and submarines to lay mines. As a result, it is impossible to determine how many ships Iran would employ to plant or lay mines in a given contingency, and some of its mines might be air dropped or laid by commercial vessels, including dhows.

Iran's amphibious ships theoretically give Iran the capability to deploy about 1,000 troops, and about 30-40 tanks in an amphibious assault, but Iran has not practiced amphibious operations using heavy weapons and has never demonstrated that it has an effective "forced entry" and across-the-beach over-the-shore capability. Iran might use commercial ferries and roll-on-roll off ships if it felt they could survive. Iran has also built up its capability to hide or shelter small ships in facilities on its islands and coastline along the Gulf, and the ability to provide them with defensive cover from anti-air and anti-ship missiles. However, all of Iran's training to date has focused on amphibious raiding or largely unopposed transit operation and not on operations using heavy weapons or larger combat operations.

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Iran has held several amphibious warfare exercises every year since 1992. These included exercises like the Great Khaibar exercise in September, 1995, which are centered on the Straits of Hormuz and Hengam Island, and which involved IRGC naval and marine units and Navy commands operating from Iranian Navy landing ships. They have since included large-scale exercises in every year that has followed.[290] Iran clearly, however, lacks the air and surface power to move its amphibious forces across the Gulf in the face of significant air/sea defenses, or to support a landing in a defended area.

Iran has also attempted to offset the weakness of its major surface forces by emphasizing unconventional forms of naval warfare. Iran has obtained three Type 877 EKM Kilo-class submarines from Russia. The Kilo is a relatively modern and quiet submarine which first became operational in 1980. The Iranian Kilos are Type 877EKM export versions. Each Type 877EKM has a teardrop hull coated with anechoic tiles to reduce noise. It has a complement of 52 men and an endurance of 45 days. Its maximum submerged speed is 17 knots and its maximum surface speed is 10 knots.

Each Kilo has six 530 mm torpedo tubes, including two wired guided torpedo tubes. Only one torpedo can be wire-guided at a time. The Kilo can carry a mix of 18 homing and wire guided torpedoes or 24 mines. Russian torpedoes are available with ranges of 15-19 kilometers, speeds of 29-40 knots, and warheads with 100, 205, and 305-kilogram weights. Their guidance systems include active sonar homing, passive homing, wire guidance, and active homing. Some reports indicate that Iran bought over 1,000 modern Soviet mines with the Kilos, and that the mines were equipped with modern magnetic, acoustic, and pressure sensors. Russia is developing both improved torpedoes, and anti-ship missiles for deployment in the 503 mm torpedo tube, but these do not seem to be operational.

Taken as a whole, Iran's new forms of sea power give it the ability to tacitly and actively threaten the flow of oil through the Gulf, and thereby the economic lifeblood of Iraq and its southern Gulf neighbors. Iran can threaten or attack shipping near the Straits until the US takes

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decisive action is taken to destroy Iran's anti-ship missile units, mine warfare capabilities, submarines, and ability to use smaller ships.

Iran can take advantage of the long shipping routes through the Gulf. It has the ability to launch mines, naval or air strikes, and anti-ship missile strikes from positions along the entire length of the Gulf and the Gulf of Oman and to threaten or harass Gulf shipping. While strategists sometimes focus on "closing the Straits" a bottle does not have to be broken at the neck, and low-level mine and unconventional warfare strikes on shipping that are designed to harass and intimidate may allow Iran to achieve its objectives much more safely than escalating to all-out attacks on the flow of oil.

As for power projection, Iran cannot project power by land without crossing Iraq, but it can carry out small amphibious operations. This allows Iran to pose a tacit or active threat to the southern Gulf states, particularly small vulnerable states like Bahrain and the UAE -- although Iran's capability to conduct such operations is currently limited. Unless the Southern Gulf states and the US to permit Iran to use ferries or commercial ships to conduct unopposed landings or transfers of troops, the Iranian Navy and IRGC are very limited in capability. While they can conduct small landing operations, these operations would be highly vulnerable unless they achieved total surprise. There is no way Iran could sustain them once US naval and air counterattacks began.

The situation is unlikely to change as long as the US maintains a major military presence in the Gulf. If Iran was to strike across the Gulf in force, the Iranian Navy and Naval Guards would need much more effective air-cover, a stronger surface fleet, and better night vision and targeting systems for their small craft, additional amphibious ships and hovercraft. Large scale assaults would also require Iran to use commercial ships with roll-on roll-off capability, and to practice over-the-beach operations using heavy equipment and armor -- training that now is totally lacking. At the same time, Iran can already use small elements of its naval forces to deploy mines and other unconventional warfare forces covertly, to supply arms to radical movements in the

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southern Gulf, seize undefended islands, and threaten or attack offshore oil operations, ports, and desalinization facilities.

Weapons of Mass Destruction

Iran's ability to threaten shipping and tanker traffic in the Gulf represents the most serious current problem that Iran presents in terms of Gulf security. In the medium to long-term, however, Iran's efforts to produce biological, chemical and nuclear weapons, and long-range missiles will present a far more serious problem. Iran is developing a Shihab-3 long-range missile with ranges of 1,300 to over 2,000 kilometers with technical help from Russia, China, and North Korea, and possibly much longer range systems.

Iran continues to develop chemical and biological weapons, and is importing equipment that is probably intended to develop fissionable material and nuclear weapons. These efforts to proliferate are so serious, and so closely linked to Iraq's efforts to proliferate that they are discussed later in a separate chapter. It is clear, however, that political change in Iran has not affected its efforts to import or try to import, key technologies for biological and nuclear weapons. Although senior U.S. officials stated in June 1999 that Iran was probably 5-10 years away from acquiring nuclear weapons, Iran will probably acquire extremely lethal biological weapons much sooner, and could assemble nuclear weapons much more quickly if it could assemble fissile material from an outside source.

Implications for US Policy

Many aspects of the current US policy towards Iran are correct, and many of the remaining flaws are the fault of Congress rather than the Clinton Administration per se. The Executive Orders the President signed to sanction Iran by block trade were more the product of domestic politics, and an effort to deflect Congressional legislation, than deliberate acts of foreign policy. ILSA was inflicted on the President in spite of these Executive Orders, and was certainly not part of the original doctrine of "dual containment."

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These US policies are reflected in the fact that the Clinton Administration and the Secretary of State have already made repeated efforts to recognize that President Khatami's election means a movement towards Iranian moderation. In March 2000, Secretary of State Madeline Albright apologized for the CIA's support of the coup that returned the Shah to power in 1953. The US has repeatedly made it clear that it wants to establish an official dialogue with the Iranian government. Members of the Iranian Majlis and US Congress have "accidentally" met, as have Secretary of State Albright and Iranian Foreign Minister Kamal Kharrazi, A public opinion survey in Iran in September 2000 showed that 55% of Iranians would support restoring relations with the US.[291]

It is easy to call for more dramatic steps on the part of the US. The Clinton Administration has almost certainly been right, however, in not "embracing" the Khatami government in ways that would give Iran's hardliners more cause to charge that Khatami was betraying the revolution and was tilting towards the "great Satan." The Administration is also almost certainly correct to fear that the moderates may not win, and that Iran could still see a far more violent struggle for power. The Iranian revolution may be unexportable, and a spent force in reshaping Islam and the political structure of the Middle East, but its scarcely over in Iran.

Once again, it must be stressed that it is as dangerous to "sanctify" Iran as to "demonize" it. Iran does continue to proliferate – and these actions are discussed in far more detail in Chapter IX. It does continue to oppose the Arab-Israeli peace process and support violent movements that commit acts of terrorism against civilians as well as attack Israel. The US has its own reasons to remember the past, including the Iranian hostage crisis and the tanker war of 1987-1988. There are still major questions about Iran's role in the November 1995 bombing of the National Guard training center and June 1996 bombing of the Al Khobar barracks in Saudi Arabia.

In recognizing that Iran has legitimate strategic interests in the Gulf, the US must not make the mistake of assuming that Iran's interests are our interests or those of our allies. Even if the US establishes correct or friendly relations within Iran, this does not mean it should ignore

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Iran's actions to increase its influence in the Gulf. Establishing an official dialogue and correct relations will not mean Iran will cease to try to force US military forces out of the Gulf or end the US role in ensuring Gulf security. Restoring commercial relations and allowing US energy investment, does not mean that the US should not try to block major destabilizing conventional arms transfers or halt Iranian proliferation.

What the US does need to do, however, is put an end to the remnants of US policy that did more to demonize Iran than is necessary, and to concentrate on fundamentals in a professional way. It needs to set the right priorities in dealing with the differences between the US and Iran and strengthen the areas where the US and Iran have common interests.

- *The Iran-Libya Sanctions Acts has not simply outlived its usefulness, it never had any. It should be repealed if the prospects for any dramatic breakthrough in US-Iranian relations should suddenly improve, and should be sunsetted into oblivion and allowed to expire if they do not. The US should also revoke the Executive Orders blocking trade and limiting US and Iranian non-official contacts*. This does not mean giving Iran a blank check. The US should very carefully monitor how Iran uses foreign investment and make sure that it does not shift funds for military purposes.

- *The US position on investment should be to encourage US and foreign investment in any well structured energy investment, swap arrangement, or commercial project in Iran – as long as it is clear that Iran will use the revenues for civil purposes and that the investment is structured in ways where the money clearly goes to its intended purpose*. The US should encourage such investment not only to ensure that Iran can be a major exporter, but to ensure that Iran's economy can meet the needs of its people and serve as a stabilizing force. It should recognize, as it does in the case of China, that when trade and investment are used for civil development, they build up the kind of contacts that act as a powerful moderating and liberalizing force.

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- *The US should continue to seek an official dialogue with Iran, showing that it is willing to forget the past, but not making concessions*. Iran and the US share a history that is a two-edged sword, and Iranians as well as Americans must face this fact. In this case, both sides can best avoid repeating the past by forgetting it. The US does not owe Iran anything other than the obligation to act out of intelligent self-interest. It should, however, do what it can to encourage Iranian pragmatism and moderation and should continue to do so even if Iran's moderates cannot act on, or even always acknowledge, US efforts.

- *It is equally important that the US remove all unnecessary barriers to unofficial contacts.* The US did not make this mistake in dealing with real enemy powers during most of the Cold War, and it should not make it with Iran.

- *The US should encourage, not discourage, dialogue and trade between its European and Gulf allies and Iran.* There are times when the US needs to admit that its European allies are right and that it is wrong. The same is true of the initiatives begun by Oman and Saudi Arabia, and not followed up by Bahrain and Qatar. This does not mean ignoring the consequences of such dialogue, investment, and trade. The US should take immediate diplomatic action to establish a dialogue of a very different kind with its allies if their actions should lead to any kind of military transfers or sales of threatening dual use technology.

- *The US should continue to support the UAE in seeking a legal and peaceful solution to the dispute over Abu Musa and the Tunbs, and make it clear it will aid the UAE in the face of any Iranian attack. It should also make it clear that it will not support any effort by the UAE to resolve the dispute by force.* The US did not take a stand on this issue when the Shah seized the islands. It has no strategic interest in any escalation of this dispute into violence.

- *The US should carefully monitor Iran's actions, but it should not treat Iran as a "terrorist nation."* The fact that Israel is a close ally of the US does not mean that every

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power that opposes Israel, or supports violent anti-Israel movements, should be treated as major terrorist power. The US should tailor its policy towards Iran to do everything possible to make it recognize Israel as a nation, accept the Arab-Israeli peace process, and halt its efforts to train, finance, and arm anti-Israeli groups. It should recognize that Iran retains all of the forces and infrastructure to support terrorism it built up in the past, and that Iran has a deeply divided regime that could renew its broad support for terrorism with little or no warning. The US should also recognize, however, that Iran has greatly reduced its support of revolutionary and extremist groups in the Gulf, and the US has no interest in Iran's actions against violent opposition groups like the MEK or various Kurdish extremists as long as these do not affect innocent civilians.

- *At the same time, the US should continue to make it clear that it has not forgotten that Iran might have been involved in the November 1995 bombing of the National Guard training center and June 1996 bombing of the Al Khobar barracks, and earlier Marine Corps barracks and US embassy bombing in Lebanon, and that the US remains to take strong military action if Iranian participation in any future such action should be repeated.* What is needed is a combination of strong US intelligence, counterterrorism, and protection efforts with the kind of diplomacy that puts constant pressure on Iran to go further in ending any remaining links to terrorist groups and abolish its training facilities, intelligence, and Revolutionary Guard elements whose primary purpose seems to be related to terrorism. The US has already made many of these adjustments in its policies, and the primary task seems to be to replace the rest of its more noisy anti-terrorism rhetoric with quiet and effective action.

- *The US should continue to recognize that the Mujahedin-e-Kkalq (MEK) is a terrorist organization under all of its various names, murdered American officers in the past, is financed and supported by Iraq as well as other sources, and use claims about democracy and human rights as a cloak for its own terrorist activities.* The MEK not

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only is a terrorist organization, it is one where the US should tacitly recognize Iran's right to use violence against it in self-defense.

- *The US should continue to fight Iran's efforts to proliferate, but it must also understand them and set suitable priorities*. Neither futile idealism about arms control nor treating all Iranian efforts as if they were equally threatening, is going to solve the problem of Iranian proliferation. As is described in detail in Chapter IX, Iranian proliferation has simply gone too far, and Iran lives in too dangerous a neighborhood. It *may*, however, be possible to persuade Iran to not openly deploy chemical weapons, or weaponize biological weapons. It *may* be possible to work out some kind of deal where the US tolerates and/or encourages Iran's development of a nuclear power industry for a clear commitment not to acquire major nuclear weapons facilities and "full" compliance with enhanced IAEA inspections. It *may* be possible to persuade Iran to halt the development and deployment of boosters and missiles that can hit the US, and to not place weapons of mass destruction on missiles that can target Israel, Turkey, and our Gulf allies. As the US has found with North Korea, proliferation cannot be halted with slogans, moralizing, empty threats, or good intentions. Pragmatic, focused diplomacy may make a difference.

- *The US should step up its efforts to block the transfer of dual-use, missile, fissile material and high technology weapons to Iran*. The US has already given high priority to blocking Russian, Chinese, European, and other transfers of weapons, dual-use technology, fissile material, and high technology weapons to Iran. It should give this effort even more priority. It should make it clear to Iran that improved relations will not affect this US policy unless Iraq should suddenly acquire access to massive new military supplies and technology. The US should also make it clear that it is none thing to lift economic sanctions and quite another to remove the threat of arms sanctions. Any nation which acts as an aggressive and destabilizing supplier of advanced arms and military technology to Iran should face massive trade and investment penalties.

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- *If an official dialogue can be established between the US and Iran, the US should be prepared to work with Iran and its Gulf allies in developing confidence building measures and other arrangements that can reduce military tensions in the Gulf.* The US should not abandon its allies or ignore the need for continued military containment in the Gulf. It should, however, be prepared for a full military dialogue with Iran and to take mutually beneficial steps to increase Gulf stability and security. These could include classic confidence – building forces posed by measures like a presence at exercises, declared deployments and military activity, arrangements to reduce the risk of incidents at sea, etc. It should also be made clear to Iran that while US will not leave the Gulf, the size of its military presence will be determined by the collective risk of both Iran and Iraq, and that US willingness to move more of its capabilities over-the-horizon will be as dependent on the Iran as Iraq.

- *At the same time, the US should make it emphatically clear that it will not take sides between Iran and Iraq, and that it is goal towards Iranian-Iraqi relations is that they establish peaceful relations and there be no further Iranian-Iraq conflicts.* A US military tilt towards either power is a recipe for disaster.

- *As has been touched upon earlier, the US has no strategic reason to become involved in any form of a "new great game" that challenges Iran in Central Asia, and should confine itself to ensuring that US companies can compete on a level playing field, and that market forces can develop the region's energy resources.* There certainly is enough oil in the Caspian and Central Asia to make oil swaps desirable in terms of increasing Iran's net oil exports and meeting the needs of US firms. There may be enough for multiple pipelines, although the future real-world volume of exports from the Caspian remains highly uncertain, and the real-world economics of pipelines through Iran may not be as desirable as many assert. The US should certainly support Turkey in economic projects, but challenging Russia and Iran in their own backyard, and trying to play a major role in Central Asian and Caspian states that are likely to be unstable for at least a decade, is far

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more likely to create problems than solutions. The best way that the US can win the “new great game” is not to play it.

There is another game that the US should not play, and one that reaches far more broadly than its relations with Iran. The US Congress can and should play a major role in US foreign policy by exhorting the Administration to examine key problems and issues, to justify its policies, and to seek appropriations and Congressional support for new foreign policy initiatives. The Congress should not, however, legislate or mandate foreign policy, attempt to micromanage it, or hold foreign policy and diplomats hostage. Both ILSA and the Iraq Liberation Act are examples example of a failed Congressional approach to micromanaging foreign policy by dictating to the executive branch. The partisanship of the last eight years has not been in the national interest in many different ways, but partisanship in the form of repeated interference in the conduct of US foreign policy by -- what may be the weakest Congressional leadership in international relations since the era of isolationism -- simply needs to stop.

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VI. Iraq: Redefining Sanctions and Containment

Iraq is one of the most troubled and repressive states in the world. It has vast oil resources and great potential wealth, but it is a nation that has been in an almost continuous state of crisis. There are few prospects that things will change decisively as long as it is under its present regime, and the aftermath of the Gulf War has scarcely improved this situation.

For nearly a decade since the ceasefire, the "war of sanctions" between Iraq's government and the UN Security Council has kept Iraq under a mix of sanctions, inspection regimes, and export and import controls that have left it politically isolated, militarily weakened, and economically crippled. Iraq has been deprived of overt access to arms imports and the technology it needs to proliferate.

Saddam Hussein has repeatedly shown that he has three major priorities and that he places all of them above the welfare of Iraq's people and its economic development: His own survival; the rebuilding of his conventional military forces; and the preservation of his capability to manufacture and deploy weapons of mass destruction.

From the first days of the cease-fire in early to present, he has systematically attempted to violate the terms of the cease-fire. He has fought and won a brutal civil war against his Shi'ite opposition in the South, and kept up constant pressure on the Kurdish enclave in the north. He had mobilized and deployed his army towards Kuwait. He has constantly challenged the UN Special Commission's (UNSCOM) efforts to destroy his weapons of mass destruction during 1991-1998 and succeed in driving UNSCOM out of the country in late 1998.

There has never been a six month period since the cease-fire, in which Saddam Hussein has not provoked a new confrontation with the UN, his neighbors, or the West. He has systematically impoverished his people, and mortgaged their hopes for future economic development, by concentrating Iraq's scarce resources on rebuilding his military forces. He refused economic aid and relief from limits on Iraq's capability to export oil, for half a decade in

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an effort to break out of sanctions. He has made constant efforts to divide the Arab world, and has courted key nations like France and Russia with oil deals and promises of future economic concessions. To all practical purposes, he has turned his defeat and the cease-fire into a "war of sanctions" based on political and economic combat.

Every fall since the end of the Gulf War has seen some new challenge to the UN. At the same time, Iraq has carried on with its efforts to exploit "sanctions fatigue" and has found that it can use UNSCOM as a tool to divide the Security Council. Iraq has coupled its efforts to rebuild its military forces with propaganda that exploits the hardships of the Iraqi people, the near-collapse of the Arab-Israeli peace process, and the concern Arab nations feel about Iraq's sovereignty and territorial integrity, and the fear many Southern Gulf states still have of Iran.

This mix of history and strategic priorities helps to explain why Saddam Hussein has continued to commit Iraq to low-level military confrontations with the US-led Coalition. It explains why Iraq's present leaders will continue to use every possible means to break out of UN sanctions import restrictions. At least for the foreseeable future, Iraq's official policy towards the rebuilding of its conventional forces and proliferation will be a mix of illegal imports, denial and lies, with occasional bluster and indirect threats.

Iraq will make every effort to conceal its true plans and the full nature of its military efforts, and only Saddam Hussein and a few trusted supporters will have any overview of Iraq's true political goals and efforts to proliferate. Furthermore, Iraq's plans and polices will remain opportunistic and change to exploit every fault line in the UN, Gulf, Arab world, and the West. Iraq's leaders will be unable predict the exact areas where they will be successful in evading or vitiating UN sanctions and controls. The only thing that seems certain is that Iraq will make a continuing effort to break out of sanctions, to divide its opposition, to obtain advanced conventional arms, and to proliferate in every way that Iraq can conceal.

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During and After Saddam

It is important to preface any analysis of this struggle with a caveat. There is a danger for US policy in personalizing this struggle, and focusing too much on overthrowing Saddam Hussein. It is likely that virtually any replacement to Saddam will be better. There is a good chance that any leader who comes to power by overthrowing Saddam will be more moderate, more pragmatic, more willing to concentrate on rebuilding Iraq, and more willing to abandon revenge and foreign adventures.

At the same time, the US is now badly over committed to overthrowing Saddam by supporting a weak outside opposition. The US now backs one faction of this opposition because, of a Congressional mandate rather than from any expert conviction. It is also a faction unified under a façade of political expediency that is unlikely to survive its coming to power – an event that is extremely unlikely in itself.

The Iraqi opposition outside Iraq can talk of grandiose military adventures, and limited US military support. It has no real military capability, however, and noble intentions are not a substitute for strength. The "outside" opposition is also deeply divided into ex-military who have fled the government, Sunni exiles, the factions the US now backs, and the Iranian-backed Shi'ite opposition. Even if Iraq should collapse from within, these divisions could paralyze or fracture any effort to form a stable and lasting government, possibly lead to civil conflict, and more probably create the conditions for the emergence of a new strongman.

Unfortunately, Iraq shows few present signs of imploding from within. Saddam is a remarkable skilled and resilient dictator. He has held full power for more than two decades and he has a vast security apparatus in addition to strong military forces. The coterie around him is equally experienced and dependent upon him for survival. His sons have proved to be equally ruthless, and one may be almost as competent. The analysis of Iraq is littered with studies that have touted Saddam's fragility and predicted his fall. Saddam is still there.

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If Saddam is brought down – and many dictators have eventually fallen with comparatively little warning -- he is far more likely to be brought down by an organized coup within Iraq than by its divided outside opposition movements. The most likely cause would be hostile faction within the army and/or security services tied to some mix of hostile Sunni clans. There have been several such attempts in the past and one may eventually succeed in spite of Saddam's political skills and instruments of repression.

Unfortunately, such a coup may not create a stable Iraq, or one that brings regional stability. There is little effective democratic and moderate opposition to Saddam Hussein. The most likely alternatives to Saddam following some unexpected "one-bullet election" is another narrowly-based authoritarian Sunni elite. If any "moderates" do seem to rise to power in the immediate aftermath of Saddam's fall, they may end as short-lived figureheads rather than remain real leaders.

A "quieter Saddam" who patiently waited to acquire significant nuclear or highly lethal biological warfare capabilities and then exploits such capabilities in a more cautious and calculating manner might prove to be just as serious a threat as Saddam. Few Iraqi regimes of any character are likely to ignore the potential threat of proliferation by Iran, Israel, and Syria. Any civil turmoil or conflict following Saddam's departure might also lead to the use of surviving or covert capabilities against the Iraqi population, and might create new forms of extremism. Regimes may then emerge that are openly revanchist in character, and/or face future financial crises that lead them into new forms of military risk taking.

Nevertheless, a change in leadership might also create a very different Iraq. Many, if not most, ordinary Iraqis do not share Saddam's ambitions, near-xenophobia, and paranoia. Figures like Kemal Ataturk and Anwar Sadat have shown that brilliant, moderate leaders can suddenly emerge and change the strategic culture of their nations. An Iraqi leader with real vision might well conclude that focusing on rebuilding Iraq's oil wealth, economic development, and the

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unification of Iraq's diverse ethnic elements would offer a far greater place in history than continuing with expensive military build-ups and the search for regional hegemony.

Even in this favorable replacement scenario, there are likely to be problems. Little about the Gulf War or the sanctions that have followed seem likely to reduce Iraqi nationalism or prevent the addition of a strong element of revanchism to Iraq's "strategic culture." Iraqis have little reason to admire the West or Iraq's neighbors. They have obvious reason to resent Britain, Kuwait, Saudi Arabia, and the US, and no reason to trust Syria, Iran, Jordan, and Turkey.

Any future Iraqi leader must be aware that virtually all of Iraq's present 'friends' and 'supporters' are opportunists seeking future trade and investment opportunities, and have no real sympathy for the regime. Further, no Iraqi can ignore the fact that the average Iraqi per capita income is well under a tenth of its level at the time the Iran-Iraq War began, and that Iraq faces a massive potential reparations and debt repayment bill once sanctions are lifted. There are striking parallel's between the costs of peace to Iraq and the costs to Weimar Germany, and the economic consequences of the peace could easily be very similar.

A new Iraqi ruling elite will also have to deal with the realities of the region it lives in. Iraq's current geography will always present problems in terms of access to the Gulf and force its leaders to deal with powerful neighbors. Regardless of how friendly any given Iranian, Saudi or Kuwaiti regime may be to Iraq at any given moment, there will always be uncertainties regarding tomorrow.

Iraq's internal divisions will also present continuing problems that will challenge the moderation of any new regime. The issue of Kurdish nationalism is unlikely to disappear and then tensions between the Sunni and Shi'ite are unlikely to end -- creating inevitable complications in terms of relations with Iran. There will be tensions with fellow exporters over Iraq's need to maximize its oil export revenues.

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Iraq will also have to deal with other proliferators like Iran and Israel, which remain very real military threats. Even a relatively defensive Iraqi regime is likely to feel compelled to go on acquiring weapons of mass destruction to counterbalance the capabilities of Iran and Israel and to limit American power projection options. Any Iraqi regime that survives over time is likely to be highly centralized, relatively ruthless, and see its neighbors and the West as a potential threat.

Living with Saddam

In the interim, the US and its Southern Gulf allies will have to live with Saddam Hussein's regime and struggle to contain it with the best mix of sanctions and military force that it can create. No one should have any illusions about "normalizing" Saddam. To all practical purposes, he has turned his defeat and the struggle over enforcing the terms of the cease-fire into an extension of war by other means.

The sanctions crisis that Saddam Hussein provoked beginning in the fall of 1997, and which led to the suspension of UNSCOM and IAEA inspection efforts in December 1998, also gave his regime a major victory in Iraq's struggle to break out of sanctions without meeting the terms of the UN cease-fire. Since that time, Iraq has intensified its efforts to exploit "sanctions fatigue" and has found that it can use it as a tool to divide the Security Council. Iraq relentlessly issues propaganda that exploits the hardships of the Iraqi people, the near-collapse of the Arab-Israeli peace process, the concern Arab nations feel about Iraq's sovereignty and territorial integrity, and the fear many Southern Gulf states still have of Iran.

Iraq continues to resist every effort to deprive it of weapons of mass destruction, and it has reason to assume that it may be able to succeed it keeping what it has retained and created new covert programs. On December 17, 1999, the Security Council passed the UK's proposed omnibus resolution on Iraq (Security Council Resolution 1284), which established a new UN weapons inspection team and lead to the suspension of sanctions. France, Russia, and China abstained. Iraq opposes the Arab-Israeli peace process, host violent anti-Israeli extremist movements, and deliberately seeks to inflame tensions. On October 3, 2000, for example, Saddam

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Hussein reacted to Israeli-Palestinian violence by pledging to "put an end to Zionism," and by attacking every other Arab leader for not using violence.[292]

The resolution's main points included the establishment of the UN Monitoring, Verification and Inspection Commission (UNMOVIC), to replace the UN Special Commission (UNSCOM). According to the resolution, if these weapons inspectors see that there is progress on disarmament and see that Iraq cooperates fully, then the resolution states that sanctions will be suspended. It also states that Iraq's cooperation with UNMOVIC will be assessed every 120 days, sanctions will be reimposed once progress is interrupted. Additionally, under this resolution, the $5.26 billion ceiling on Iraqi oil sales under the six-month phases of the oil-for-food program would automatically be lifted. As for Iraq's oil industry, a group of experts were to submit a report within 100 days and recommend ways of increasing production and exports through "involving foreign oil companies in Iraq's oil sector, including investments, subject to appropriate monitoring and controls."[293]

Iraq has defied this new UN compromise, but this has not prevented Iraq from increasing its oil revenues and gradually eroding the effectiveness of UN economic sanctions. In March 2000, the Security Council agreed to double the spending cap for oil sector spare parts and equipment (under Resolution 1175 of June 20, 1998), allowing Iraq to spend up to $600 million every 6 months repairing oil facilities. It did so after Secretary General Annan had warned of a possible "major breakdown" in Iraq's oil industry if spare parts and equipment were not forthcoming. The Security Council voted in April 2000 to allow Iraq to import $1.2 billion in spare parts and other equipment to repair its degrading oil production facilities. This effectively ended any cap on Iraq's oil export earning which are now at levels higher than Iraq's average real earnings before the Iran-Iraq and Gulf Wars.

Allowing Iraq to produce at near capacity has given Saddam a potential oil weapon. In August 2000, a senior Iraqi oil official stated that delays by the United Nations in approving contracts to upgrade Iraq's oil sector were threatening production levels. The United States has

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said that the $300 million should be used only for short-term improvements to the Iraqi oil industry, and not to make long-term repairs. Iraq claimed in August 2000 that 508 contracts were on hold or pending approval by the United Nations. Of this total, 440 were "held" by the United States, according to Iraq's oil ministry. This situation allows the Iraqi regime to "play" the West and oil importers by threatening or implementing production cuts, while it also allows it to offer other nations oil deals as an incentive for easing their support of sanctions. It also gives Iraq leverage in resisting any resumption of UN inspections.

Meanwhile, the UN Monitoring, Verification and Inspection Commission (UNMOVIC), the new inspection body the UN created in December 1999 to create an inspection force more acceptable to Iraq, has become "UNMOVING." Although the terms of inspection effort were eased to please Iraq, Iraq has refused to consider letting it begin its work. In late August 2000, a spokesman for UNMOVIC said that it ready to send a new inspection team.. On August 24, 2000, Iraq's Deputy Prime Minister, Tariq Aziz replied that "Iraq will not cooperate." Iraq has since resisted French and Russian pressure to compromise, and it now seems likely that the only inspection effort that Iraq will ever accept is one so ineffective that Iraq can let it in and win relief from sanctions with no more than token losses of its capability to proliferate.[294]

Reparations have now joined the hardship of the Iraqi people as a political issue. In late August 2000, the UN Security Council was deadlocked over a Kuwait Petroleum Corporation (KPC) request for $21.6 billion in reparations as compensation for lost oil and gas sales resulting from Iraq's invasion of Kuwait and subsequent Iraqi sabotage of the wells. In June 2000, the UN's compensation commission recommended that KPC be awarded $15.9 billion, but France and Russia objected, and no award was made. Over the years, the UN compensation commission has paid out more than $8 billion in claims, mainly to individuals or small businesses hurt by Iraq's invasion of Kuwait. With Iraqi oil revenues now rising into the tens of billions of dollars annually, however, Iraq (with backing by Russia and France) now is increasing its resistance to further large-scale reparations. Russia and France has proposed reducing—from 30% to 20% -- the

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proportion of proceeds from the "oil-for-food" program earmarked for reparations, and the US, Britain and other supporters of sanctions have compromised. [295]

Iraq's efforts to play the oil card have also become steadily more serious. In late August 2000, Venezuela's President Hugo Chávez met with Saddam Hussein, a move that was strongly condemned by the United States. Earlier in the month, Iraq celebrated the twelfth anniversary of the end of its war with Iran and marked the tenth anniversary of its invasion of Kuwait (August 2, 1990). [296] While the involvement of international companies remains dependent on the lifting of the sanctions, the EIA reports that intensive foreign interest in Iraqi oil development: [297]

> "As of early September 2000, Iraq reportedly had signed several multi-billion dollar deals with foreign oil companies, mainly from China, France, and Russia (U.S., Canadian, and Vietnamese firms also reportedly have held discussions). Iraq reportedly has become increasingly frustrated, however, at the failure of these companies actually to begin work on the ground, and has threatened to no longer sign deals unless firms agreed to do so without delay. Iraqi upstream oil contracts generally require that companies start work immediately, but UN sanctions overwhelmingly have dissuaded companies from doing so.
>
> Russia, which is owed several billions of dollars by Iraq for past arms deliveries, has a $3.5-billion, 23-year deal with Iraq to rehabilitate Iraqi oilfields, particularly the 15-billion-barrel West Qurna field (located west of Basra near the Rumaila field). Since a deal was signed in March 1997, Russia's Lukoil (the operator, heading a Russian consortium plus an Iraqi company to be selected by the Iraqi government) has prepared a plan to install equipment with capacity to produce 100,000 bbl/d from West Qurna's Mishrif formation. Meanwhile, in August 2000, Iraqi engineers reportedly completed work on two degassing stations at West Qurna, with two more planned for 2001, potentially raising production at the field (one of the world's largest) to around 400,000 bbl/d. West Qurna is believed to have potential production capacity of up to 1 MMBD. In October 1999, Russian officials reportedly said that Iraq had accepted a Russian request to delay work on West Qurna given the continuation of UN sanctions. This followed an Iraqi warning that Lukoil could lose its contract (and possibly be replaced by another Russian company) at West Qurna if it did not begin work immediately (Lukoil has been restrained from doing so by UN sanctions).
>
> In late August 2000, a joint Russian-Belarus oil company, Slavneft, was reported to be in talks with Iraqi officials on the billion-barrel, Suba-Luhais field in southern Iraq. Full development of Suba-Luhais could result in production of 100,000 bbl/d at a cost of $300 million over three years.
>
> Besides West Qurna, PSCs for the three other large southern oil fields are in various stages of negotiation. The largest of the fields is Majnoon, with reserves of 10-30 billion barrels of 28o-35o API oil, and located 30 miles north of Basrah on the Iranian border. French company TotalFinaElf reportedly has negotiated with Iraq on development rights for Majnoon. Initial output at Majnoon is expected to be 300,000 bbl/d, with later development yielding 600,000 bbl/d or more. Ultimate production potential is estimated at up to 2 MMBD. As of September 1999, Elf and Total reportedly needed only "the stroke of the pen" to complete deals on Majnoon and the 6-billion barrel Nahr Umar field. However, in December 1999, Iraq threatened

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> that the two companies would lose their "preferential treatment" if France did not provide sufficient support to Iraq on the UN Security Council.
>
> TotalFinaElf apparently has all but agreed with Iraq on development of the Nahr Umar field. Initial output from Nahr Umar is expected to be around 440,000 bbl/d of 42^{o} API crude, but may reach 500,000 bbl/d with more extensive development. The 5-billion barrel Halfaya project is the final large field development in southern Iraq. A variety of companies reportedly have shown interest in the field, which ultimately could yield 200,000-300,000 bbl/d in output.
>
> Smaller fields with under 2 billion barrels in reserves also are receiving interest from foreign oil companies. These fields include Nasiriya, Khormala, Hamrin, and Gharraf. Italy's Agip and Spain's Repsol appear to be strong possibilities to develop Nasiriya.
>
> In addition to the 25 new field projects, Iraq plans to offer foreign oil companies service contracts to apply technology to 8 already-producing fields. Meanwhile, Iraq has authorized "risk contracts" to promote exploration in the nine remote Western Desert blocs. Iraq has identified at least 110 prospects from previous seismic work in this region near the Jordanian and Saudi borders.
>
> …More than 50 foreign companies attended an oil and gas technology exhibition in Baghdad in September 1999,, the first such gathering in 10 years. Most of the firms were from the Canada, France, Italy, and the United Kingdom. No U.S. firms attended, although a high-level Iraqi oil official has stated that Iraq is ready to deal with U.S. oil companies. Iraq's oil ministry also introduced amendments to existing development and production contracts (DPCs) in 2000 to help attract foreign investment to the country's energy sector. Among other things, the duration of DPCs was reduced from 23 to 12 years. In addition, Iraq has added a clause referring to "an explicit commitment to achieve target production within a set period."

So far, Iraq has put oil export revenues before any political opportunism or strategic blackmail it might get from cutting its oil exports. It has instead doe no more than issue the occasional threat to cut production while blaming the UN sanctions for low oil production levels and the price rises after early 1999. Senior officials like Saddam Hussein's Deputy, Vice President Taha Yassin Ramadan, have also said that Iraq will not cut production and that, "Iraq is not an opportunist…Iraq has never held back oil supplies under any circumstances as long as it has the ability to maintain production." Iraq has broken almost all of its promises in the past, however, and it not only *is* an opportunist, it is a remarkably ruthless one.[298]

The humanitarian issue too become has steadily more serious in spite of massive "oil for food" payments that almost certainly equal the share of revenues Saddam would allocated to civil spending if sanctions were lifted. There is a rising discontent against the human impact sanctions against Iraq. Most notably, the senior UN humanitarian coordinator has urged an end to

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sanctions, calling them "a true human tragedy." His predecessor, Dennis Halliday was equally critical of the sanctions and resigned as a result.[299] The Iraqi media has consistently recently claimed more than a million people had died as a result of the embargo, yet even more cautious studies by outside researchers show very real increases in infant mortality, malnutrition, and disease.

As discussed later, many of these charges are propaganda. Nevertheless, "Oil for food" also is no substitute for a viable economy and coherent efforts to bring Iraq back to its pre Iran-Iraq and Gulf War level of development. Iraq may have been allowed to sell unlimited quantities of oil -- with earnings monitored and expenditures controlled in a UN escrow account since December 1999 --.the Iraqi economy is still in serious trouble. Recent US government reporting notes that,[300]

> "Iraq's economy, infrastructure, and society remain in extremely bad shape. Iraq's Gross Domestic Product (GDP) has fallen sharply since before the Iraqi invasion of Kuwait, with per-capita income (around $653) and living standards far below pre-war levels. On the other hand, with oil production and prices up substantially, Iraq's real GDP growth in 2000 is estimated at 15% (with 19% real growth expected in 2001). Inflation currently is estimated at around 120% (expected to decline to 80% in 2001), with unemployment (and underemployment) high as well. Iraq's merchandise trade surplus is over $5 billion, although much of this is under United Nations (UN) control. Iraq has a heavy debt burden, possibly as high as $130 billion if debts to Gulf states and Russia are included. Iraq also has no meaningful taxation system, and bribery is widespread.
>
> Iraq reportedly has established a capital fund, in part to help shore up the value of its currency, the dinar, by encouraging locally-financed projects. As of June 2000, the dinar had slipped from around 900 dinars per U.S. dollar at the beginning of 2000, to around 2,000 dinars per U.S. dollar as of early September 2000. Local production in Iraq has slipped badly under sanctions, and the country is forced to import almost everything it needs."

Iraq has sold some $35 billion worth of oil under the oil for food program during the last four years, and 2000 will give it a major windfall.[301] While 30% of this money has gone for reparations (25% after December 2000), this is still a vast amount of money. The tragedy is, however, that no foreseeable amount of oil wealth – with or without sanctions -- is now capable of giving Iraq a healthy economy without years of massive economic restructuring and reform. High oil prices mean that the Iraq will see its oil revenues rise from $11.4 billion in current dollars

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in 1999 to at least $21-25 billion in 2000. This a rise of at least 80% between 1999 and 2000, and a rise of over 200% over Iraq's earnings in 1988.

Iraq will certainly benefit from the fact that its export earnings in 2000 will probably be more far more than *double* its former UN oil export ceiling -- which was $10.5 billion a year, or $5.26 billion every 180 days). Iraq's total GNP is now so dependent on these oil revenues, however, that most Iraqi's must still live near or well below the poverty line, and transfers of oil revenue into food and medicine do not create jobs, factories, a diversified economy or broadly based international trade. [302]

To put these totals in perspective, the value of Iraq's oil exports rose from $4.5 billion annually in 1972 to a peak of $43.6 billion in 1980, only to drop to $8.0 billion in 1986 because of the Iran-Iraq War and then to virtual nil during the Gulf War. But, Iraq's earnings in constant 1990 dollars will still be only one-third of its peak earnings in 1980 and Iraq is now a nation of nearly 24 million people. [303]

The Importance of Iraqi Oil Exports

This "war of sanctions" takes on strategic meaning because maintaining and increasing Iraqi oil production is critical to meeting future world demand for oil. The EIA estimates that Iraq contains 112 billion barrels of proven oil reserves, the second largest in the world (behind Saudi Arabia) along with roughly 215 billion barrels of probable and possible resources. It also reports that Iraq's true resource potential may be understated, as deeper oil-bearing formations located mainly in the Western Desert region could yield additional resources, but have not been explored.[304]

The EIA estimates that Iraq will increase its oil production capacity from 2.2 million barrels per day in 1990, and 1.6 million barrels per day in 1998, to 3.2 (2.8-3.4) million barrels per day in 2005, and then to 6.2 (5.2-7.2) million barrels per day in 2020. To put these numbers in perspective, the Department of Energy estimates that Iraq will increase from less than 4% of

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world production in 1998, to approximately the same in 2000, 4.3% in 2010, and 5.4% in 2020.[305]

It is unclear, however, that this expansion in Iraqi capacity will take place unless sanctions are modified or lifted. The date that Saybolt and other experts have issued on Iraqi oil field development are somewhat uncertain, but it seems clear that Iraq's oil fields and shipping and production facilities badly need a far faster flow of spare parts and modernization than the UN has yet made possible. Iraq is probably damaging its fields, and reducing ultimate recovery from them, by overproduction. It has no UN authority to import the equipment and foreign technical support to develop mew fields or fully modernize and exploit existing fields and its deals to allow foreign investment in this development remain illegal. They are only potential deals until UN sanctions are lifted. The projections of the EIA, and similar projections by the IEA and OPEC, assume that sanctions will not continue much beyond 2000, and are so optimistic that they may already set impossible near term goals.

Shifts in Iraqi Oil Exports

Iraqi oil has now played an erratic role in the world market for more than two decades. Iraq was producing over 3 million barrels/day and exporting 2.8 million barrels/day before it invaded Kuwait in August 1990. Iraq was producing over 3 million bbl/d and exporting 2.8 million bbl/d (1.6 million bbl/d via pipeline to the Turkish port of Ceyhan; 800,000 bbl/d via the IPSA2 pipeline across Saudi Arabia; 300,000 bbl/d via the Gulf port of Mina al-Bakr; and somewhat less than 100,000 bbl/d by truck through Turkey.

Following the invasion, Iraqi oil exports were prohibited by UN Security Council Resolution 661. In April 1995, the Security Council passed Resolution 986 known as the "oil for food" program. It allowed limited Iraqi oil exports for humanitarian and other purposes. The Iraqi Cabinet turned down this offer on April 16, 1995. The agreement gave the UN control over Iraq's oil exports and revenues, and deducted a predetermined amount for war reparations to Kuwait and to fund operations of the United Nations Special Commission, or UNSCOM). It also required

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that half of the Iraqi oil shipments be exported via Turkey to help Turkey regain oil transit revenues that were lost during the ban on Iraqi exports. [306]

The growing economic crisis in Iraq then forced its regime to accept an agreement with the UN that allowed Iraq to sell two billion dollars worth of oil for food and medical supplies on May 20, 1996. The actual implementation of the resolution was frozen on September 1, 1996, however, because of Iraqi attacks in northern Iraq and Iraqi efforts to renegotiate the accord. Iraq only started actual exports of oil in December 1996.

Since that time, the Iraqi Oil-for-Food program has been extended several times, beginning on December 4, 1997. On February 20, 1998, the Security Council unanimously approved an increase in the amount of oil Iraq may export from $2.14 billion to $5.265 billion over a 180-day period. The program was extended again on March 25, 1998. On November 24, 1998, the UN extension also included an allowance of $300 million for spare parts and other material needed to rebuild Iraq's oil industry to enable it to export the additional oil. This has since been raised to well over $600 million, but Iraq is still prohibited from investing in major new oil facilities. [307]

Since Iraq accepted the UN "oil for food" deal, however, Iraqi oil production has increased by over 2 million bbl/d—from 550,000 bbl/d to monthly peaks approaching 3 million bbl/d. In 1997 and 1998, rapidly increasing Iraqi oil exports played a significant role in creating a world oil glut and causing a price collapse. Iraqi oil exports reached an estimated 1.5 million bbl/d in April 1998 and around 2.2 million bbl/d in October 1999, before falling off sharply in November and December due to an impasse over UN weapons inspections.[308] The EIA reports that 2000, Iraqi crude oil production averaged 2.54 MMBD in the first half of 2000 and reached 3 MMBD in August 2000,

About 450,000-500,000 bbl/d of Iraq's oil output is now consumed domestically, with another 70,000-90,000 bbl/d trucked to Jordan under a special UN exemption, leaving around 2 MMBD for export. Besides the 70,000-90,000 bbl/d of this going to Jordan (authorized by the

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United Nations) and the 450,000-500,000 bbl/d or so consumed domestically, the rest was exported either through the Iraq-Turkey pipeline or the Persian Gulf port of Mina al-Bakr. Although UN Resolution 986 mandates that at least half of the "oil-for-food" exports must transit through Turkey, it appears that in recent months more Iraqi oil has been exported via Mina al-Bakr. Iraqi oil commonly is sold initially to Russian firms, with other large purchasers including French and Chinese companies. Oil is then resold to a variety of oil companies, including about 700,000 bbl/d to U.S.-based companies.[309]

Iraq has also smuggled up to 100,000 bbl/d of crude oil and products via a number of routes. These include: to Turkey, Jordan, and Syria via truck, to Iran (and onward to Pakistan and India) along the Gulf coast and via Qais Island, and to Dubai with the use of small tankers sailing from Umm Qasr. Press reports also have estimated that these illegal shipments may have provided Iraq with as much as $25-$40 million per month in revenues. [310]

Iraqi officials initially claimed that they would increase the country's oil production to 3.4 MMBD by the end of 2000, but now recognize that this is not realistic, given technical problems with Iraqi oil fields, export terminals, pipelines, and other oil infrastructure. Industry experts generally assess Iraq's sustainable economic production capacity, without damage to ultimate oil field production capacity, at no higher than 2.9-3.0 MMBD. It may be closer to 2.6 MMBD (with net exports of around 2.0 MMBD). Iraq's battle with "water cut" is a major challenge, especially in the south. In October 1999, oil consulting firm Saybolt International reported that Iraq has been able to increase its oil production through use of short-term techniques not generally considered acceptable in the oil industry.[311]

As a result, Iraq may have to cut oil production for technical reasons, even if it does not use such cuts as a political weapon. If it does not, increases in Iraqi production will make the world substantially more vulnerable to any interruption in Iraqi exports at a time of exceptionally high demand, and Iraqi policy is uncertain. While the UN Security Council ended the previous limit on Iraqi oil export revenues -- $5.26 billion per every 6 months in December 1999, Iraq has

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informally, and somewhat vaguely, claimed continued adherence to the limit. If Iraq were to adhere unilaterally to the old $5.26-billion, oil export revenue target for six month periods, it would only need to sustain oil exports of around 1.2 million bbl/d even at $25 per barrel. [312] The problem is not simply too little Iraqi oil in the future. It is too much global dependence on Iraqi oil production in the present.

Iraqi Gas

Sanctions could also affect Iraqi gas exports and use of gas to maintain oil production. Iraq contains 110 trillion cubic feet (Tcf) of proven natural gas reserves, along with roughly 150 Tcf in probable reserves. About 70% are associated gas (gas produced in conjunction with oil), with the rest made up of non-associated gas (20%) and dome gas (10%). Iraq produced 104 billion cubic feet (Bcf) in 1998, down drastically from peak output levels of 700 Bcf in 1979. Within two years after the lifting of UN sanctions, Iraq hopes to produce 550 Bcf of gas.

Iraq seeks to produce about 4.2 Tcf of gas annually within the next decade. Gas is now produced with oil and also used for reinjection for enhanced oil recovery efforts. In October 1997, Iraq invited international partners to invest in natural gas projects worth $4.2 billion, however, and this could either free gas for export or support the beginning of a major petrochemical industry. As might be expected, Iraq's policy is to award gas and oil concessions to companies from countries supporting the easing or lifting of UN sanctions (i.e., France, China, Russia).[313]

Iraqi Export Routes

Along with Saudi Arabia, Iraq is one of two Gulf nations that has export routes that do not go through the Strait of Hormuz. These routes are also another aspect of the war of sanctions. Iraq has a number of routes for exporting oil, although some are closed and most need major maintenance and development. The 600-mile long Kirkuk-Ceyhan pipeline is Iraq's largest operable crude export pipeline, and the UN Security Council requires most Iraqi exports to flow through this line. The EIA reports that this Iraq-Turkey link consists has a fully-operational capacity of 1.1 MMBD, but now can handle only around 900,000 bbl/d (1-1.1 MMBD at most)

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at. A second, parallel, 46-inch line has an optimal capacity of 500,000 bbl/d and was designed to carry Basrah Regular exports, but is currently inoperable.[314]

The two parallel lines have a combined optimal capacity of 1.5-1.6 MMBD. Expanding capacity to this level, however, would depends on Iraq's ability to rehabilitate the IT-1 and IT-1A pumping stations, as well as the Zakho metering station near the Iraq-Turkey border and other ongoing pipeline repairs (including so-called "intelligent pigging") on the 46-inch line. The EIA reports this work is well behind schedule. Iraq is now bypassing the crucial but damaged IT-2 pumping station, located about 93 miles south of the Turkish border, making it more difficult to reach the 1.6 MMBD dual-line capacity. To make IT-2 operational, Iraqi officials have said that they need controls and associated valves costing around $50 million. The IT-1 pumping station near Kirkuk received lighter damage and is presently functional.

Iraq and Syria have often had hostile relations, and Syria fought against Iraq in the Gulf War. They have established "friendly" relations in recent years, however, and reopened their border in June 1997 -- after a 17-year closure—for trade and official visits. They signed a memorandum of understanding on August 20, 1998 for the possible reopening of the Banias oil pipeline from Iraq's northern Kirkuk oil fields to Syria's Mediterranean port of Banias and Tripoli, Lebanon. In October 1999, Iraqi experts reportedly assessed the pipeline as being initially capable of pumping up to 300,000 bbl/d (out of potential capacity of 400,000 bbl/d). Iraq would need UN permission to export any oil via Syria. As of August 2000, work reportedly was still underway on repairing the Syria-Iraq line.

Iraq also has major export facilities in the Gulf. It has three tanker terminals in the Gulf: at Mina al-Bakr, Khor al-Amaya, and Khor al-Zubair (which mainly handles dry goods). Iraq also has additional dry goods ports at Basrah and at Umm Qasr, which is being outfitted to accommodate crude tankers. The EIA reports that Mina al-Bakr has been repaired in large part and the terminal currently can handle up to 1.3-1.4 MMBD. Iraq's Khor al-Amaya terminal was virtually destroyed during the Iran-Iraq War, and has been out of commission since then. As of

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July 2000, reports indicated that Iraq was repairing two berths at Khor al-Amaya, with a goal of reaching export capacity of 700,000 bbl/d by the end of 2000. Upon full completion of repairs, Iraq projects Khor al-Amaya's capacity will rise to 1.2 MMBD. Iraq will need UN Security Council approval to export from Khor al-Amaya, since it is not part of the approved export outlet of Mina al-Bakr.

Iraq's Energy and Sanctions

In short, the world faces a continuing dilemma between the need to contain Saddam Hussein and the need to help Iraq develop and expand its energy exports. It is a dilemma that is made far worse by the humanitarian crisis in Iraq, but it is necessary to keep this crisis in careful perspective.

Iraq's economy has been destroyed by the consequences of Saddam Hussein's military adventures and refusal to meet the terms of the ceasefire in the Gulf War, and not by post-Gulf War sanctions. Iraq's per capita income peaked just after the Iran-Iraq War began because Iraq has been able to exploit the rise in oil prices following the fall of the Shah. At this point, Iraq had a per capita income in excess of $4,000 in 1997 US dollars. It was also spending about 34% of its national budget and 25% of its GNP on military forces.

By 1982, Iraq faced with a serious risk of losing the Gulf War to Iran and was spending over 70% of its budget and 45% of its GNP on military forces. These extraordinarily high spending levels were sustained and finally enabled Iraq to win the Iran-Iraq War in 1988. By that time, however, a massive drop in oil exports and the failure to develop the economy had cut Iraq's per capita to around $2,200 dollars, or roughly in half. Iraq had exhausted its national savings and financial reserves on Saddam Hussein's military adventures and was now a major debtor. During the Iran-Iraq War, the Iraqi government had neglected every sector of its economy -- especially agriculture -- and was importing two-thirds of its food. Iraq did cut its military expenditures following the cease-fire in August 1988, from levels of around $24 billion in 1988 (in constant 1997 dollars) to levels around $16 billion in 1989 and the first half of 1990.[315]

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Peace, however, led to a major drop in oil prices and revenues, and Iraq's per capita income dropped to levels around $1,500 in 1989. Nevertheless, there was no "peace dividend" in spite of Iran's massive defeat, its loss of 40-60% of its major land weapons, and its failure to launch a major post-war rearmament program. Military spending remained as high as 60% of the national budget. The build-up of Iraq's military forces in 1990 then raised military spending back to 75% of the national budget. The national mobilization and the oil embargo following Iraq's invasion of Kuwait then cut the per capita income to around $750 before any fighting began in the Gulf War.

After its defeat in the Gulf War, Iraq resisted international efforts to establish the oil-for-food program for five years. The Security Council attempted to create a version of the oil-for-food program as early as 1991 to allow Iraqi oil to be sold, with proceeds deposited in a UN-controlled account and used to purchase humanitarian goods for the Iraqi people. The Iraqi regime rejected the Security Council's original proposal and those that followed. The Iraqi government refused to accept any humanitarian relief on the grounds any controls on how it used the money interfered with its sovereignty. Finally, the Security Council adopted the oil-for-food resolution discussed earlier in 1995, and did so over Iraq's protests. The Iraqi regime again refused to accept it. It was only after another year and a half of Iraqi delays and international pressure that the Iraq regime agreed to accept oil-for-food.

Between 1991 and Iraq's acceptance of the "oil for food deal" in May 1996, the "war of sanctions" kept Iraq's per capita income to levels of $500-900 dollars, increases in prices impoverished most Iraqis, and shortages occurred in food and medical care.[316] Once Iraq did accept "oil for food," its oil exports did not earn anything like its revised quota of $5.26 billion in oil revenues every six months until 1999. The total value of its sales was less than $3 billion during the last six months of 1998. This was a matter of oil prices, however, and not sanctions per se. The Iraqi people would probably have been even worse off if Saddam had been free to spend his usual amount on military forces, weapons of mass destruction, and luxury imports for his supporters.

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There are, however, good reasons to make major changes to the present sanctions. They place severe limits to how Iraq can allocate the revenue it does receive from "oil for food." While two thirds of the money raised from oil sales is available for buying food and other humanitarian goods, another 30 percent goes into the Kuwait compensation fund and the remainder is spent on the arms inspectors and administrative expenses. There are also constant problems with the approval of orders and the failure to issue the proper orders, while the Iraqi people continue to suffer.

There is considerable controversy over how real the "hardship" issue is, and some on-the-scene observers feel Iraqi is politicizing it and exaggerating the suffering of its people. According to UN figures published in the spring of 1997, Iraq imported 6.5 million tons of food and $330 million worth of medical goods since the first shipments began in March 1997. Nevertheless, the UN concluded that it needed to allocate more money to food, and less to other humanitarian needs like medicine and health care, to succeed in raising the nutritional value of the food ration each Iraqi receives from 2,030 calories a day in 1997 to 2,268 calories this year. (2,000 calories is regarded as about the minimum for healthy living.)

The United Nations Children's Fund warned in September 1997 that unless Iraq properly implemented the new UN oil-for-food plan, it would do little to offset worsening malnutrition suffered by Iraqi women and children. The UN report also claimed that the infant mortality rate had almost tripled between 1990 and 1998, while the number of mothers dying while giving birth rose from 117 to 310 per 100,000 births between 1990 and 1996. According to a UNICEF survey, over one million Iraqi children under five are suffering from malnutrition. Iraq's Health Ministry has claimed, some 57,000 Iraqi children under the age of five were dying every year. These reports – and similar reports by the World Health Organization and Food and Agricultural Organization – have severe defect and rely so heavily on Iraqi data that they are almost totally unreliable. They also do not mention Iraq's ongoing civil war against its Shi'ites, treatment of its Kurds, or any of the other painful realities of Saddam's regime. Nevertheless, they do contain

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enough actual research to indicate that there were problems with malnutrition, infant mortality, and medical services.[317]

The Iraqi regime has not only used these hardships as a political weapon, it has done as terrible a job of managing its portion of the oil for food program as it has of managing every other aspect of the economy. UN officials held repeated discussions with Baghdad during 1997 and 1998 asking it to prioritize its humanitarian purchases. Iraq responded by complaining about delays in contract approvals and deliveries of goods. Iraqi health officials have charged that less than 1 percent of the $200 million in medical supplies that Baghdad was permitted to buy during the first six months of 1998 had arrived in the country. UN spokesman Eric Falt acknowledged that medicine deliveries were “slower than expected," but said $17 million, or 9 percent of the medical supplies, had arrived during the third phase.

Iraq exploits the situation almost regardless of what actually happens in the oil for food program. In spite of a steady improvement in the flow of goods during 1998, Health Minister Umeed Madhat Mubarak claimed in August that more than one million Iraqi children had died as a result of sanctions. He said an average of 6,452 children under the age of five were now dying each month, compared with 539 a month before the Gulf crisis.

The Iraqi Health Ministry claimed on December 29, 1998, that more than 8,800 Iraqis had died in November as a result of UN sanctions and that, “6,269 children below five years and 2,584 elderly persons died during November 1998...as a result of different sorts of diseases caused by the continuation of the embargo imposed on Iraq more than eight years ago.” The Ministry said its data showed that in November 1989, the year before the imposition of sanctions, only 258 Iraqi children and 422 adults died, and that its statistics for children's deaths in November 1998 revealed that 1,631 died from complications of diarrhea, 2,419 of pneumonia and 2,219 of malnutrition. Of the adult deaths, 579 were due to heart diseases and high blood pressure, 413 to diabetes and 1,592 to “tumor diseases.”

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With similar statically absurb precision, Iraqi charged in June 1999 that the "mortality among Iraqis due to the sanctions…totaled 1,159,807 citizens." It claimed that infant mortality totaled 92.7 cases for every 1,000 deliveries, and that 117 women died in childbirth.[318]

In spite of the major increases in oil revenues, and deliveries of food and medicine, throughout 1999, Iraq continued to report monthly death rates of from 8,000 to 13,000, mostly among children and the elderly. According to official Iraqi figures, the toll of premature deaths due to sanctions has reached 1.2 million. An August 1999 report from UNICEF asserted that child mortality rates had more than doubled since the Persian Gulf War in the parts of Iraq controlled by Baghdad, from 56 deaths per 1,000 births in 1984-89 to 131 deaths in 1994-99.[319] (Child mortality rates in the autonomous Kurdish north, by contrast, appear to have dropped by more than 20%.)

It is also important to note that this report included areas in Southern Iraq where Iraqi troops had been fighting the Shi'ites since 1991, and that the Iraqi government has never given its rural Shi'ites anything like the funding it has provided to mixed urban areas and Sunnis in the north. The UNICEF report, like far too much UN and humanitarian report, was flawed to near total incompetence by (a) reliance on official Iraqi statistics for 1984-1989, and (b) the total failure to look at the impact of the Iraqi governments actions in dealing with Shi'ites and Kurds, treatment of the Marsh Arabs, and use of the military, security forces, and deliberate restrictions in government funding to ensure regime control and survival.[320]

Speaking in October, UNICEF chief Carol Bellamy said both Baghdad and the international community were to blame for death resulting from the slow distribution of humanitarian aid.[321] Meanwhile, British Labour MP George Galloway publicized Iraq's claims with his so-called "Maryam" campaign, decrying UN sanctions as genocide and urging Arab states to break the embargo. Other critics, such as Hans von Sponeck, the UN humanitarian coordinator in Iraq, made similar charges without ever bothering to examine the conduct of the Iraqi regime.[322]

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There is no question as to whether the Iraqi people have truly suffered, but there are three critical problems with the kind of dramatic claims made by Iraqi officials, and some UN organizations and NGOs.

- First, they almost always ignore the sharp and steady drop in Iraqi living standards after 1983 that occurred because of the Iran-Iraq War, and that the real per capita income of Iraq dropped by over 60% between 1982 and 1989 because of the Iran-Iraq War, and before the Gulf War and UN Sanctions began.

- Second, the Iraqi and UN data usually assume that Iraqi figures for pre-sanctions health, education, and nutrition data are correct – which is little more than mindless rubbish given the impact of the Iran-Iraq War and Iraq's obsessive propaganda during that war.

- Third, Iraqi official census figures show that the population of Iraq rose from 16.3 million in 1987 to 22 million in 1997. If such figures are taken seriously, Iraq has had the highest rate of population growth in its history during a period of extreme hardship and high infant mortality, and would have to have sustained one of the highest population growth rates in the world for over eight years if its mortality statistics are correct.

Many of Iraq's own statistics contradict some of the more dire reports about the hardship in Iraq. In October 1997, Iraq imposed a curfew to conduct its first census in 10 years. The census concluded that Iraq had a total of some 22 million people, including an estimated 3.2 million in Northern Iraq. The figures also failed to reflect anything approaching the rate of child mortality that some reports had warned about, or the impact of diseases and malnutrition. In fact, outside estimates indicated that Iraq had a population growth rate of 3.69%, one of the highest rates of growth in the world.[323]

Ironically, Iraq's figures also tend to support CIA estimates. The CIA estimated in 1996 that Iraq had a birth rate of 43.07 births/1,000 population, a death rate of 6.57 deaths/1,000 population, and an infant mortality rate of 60 deaths/1,000 live births. Iraq's life expectancy at birth was 66.95 years for the entire population, 65.92 years for males, and 68.03 years for females. In 1989, using exactly the same methodology, the CIA estimated that Iraq had a birth rate of 46 births/1,000 population, a death rate of 7.00 deaths/1,000 population, and an infant mortality rate of 67 deaths/1,000 live births. Iraq's life expectancy at birth was exactly the same for males and females. In short, if the CIA estimates are correct, the death rate in Iraq dropped

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slightly of more than half a decade of sanctions, and infant mortality and life expectancy were exactly the same.[324]

It is also important to note what was actually happening in 1999, when the sudden massive rise in oil prices gave Iraq a massive windfall in oil revenues. The one meaningful US critique of Iraq's charges, which was written in September 1999 – long after Iraq's oil revenues had risen to high levels – makes the following points about the impact of sanctions and the state of the oil for food in late 1999:[325]

- Iraqi oil exports are now at near pre-war levels and revenues are above what Iraq was receiving during the Iran-Iraq war. For the six-month period June-November 1999, Iraqi oil exports are projected to exceed $6 billion.

- Previously Iraq had said it was unable to produce enough oil to meet oil-for-food ceilings because the UN refused to approve contracts for spare parts for its petroleum industry. The facts demonstrate otherwise. In the two and a half years that the oil-for-food program has been functioning, Iraq has been able to sell over $14.9 billion in oil. Iraqi oil exports are near pre-war levels, and rising world oil prices are allowing more oil-for-food goods to be purchased. The oil-for-food program has delivered $3.7 billion worth of food, $691 million worth of medicine, and more than $500 million worth of supplies for electrical, water/sanitation, agricultural, education, oil industry, settlement rehabilitation and demining projects.

- Over 94% of all requested oil-for-food goods have been approved. That is $8.9 billion worth of humanitarian items for the Iraqi people. No holds are placed on food and medicine.

    - The 6% of goods which are on hold include contracts for dual-use items that Iraq can use to rebuild its military capabilities. Holds are placed on contracts that do not have enough information to determine whether they include dual-use items. Once that information is provided, these holds are often released. In other cases, holds are placed on con-tracts submitted by firms with a record of sanctions violations. Contract holds are not the problem. It is Saddam Hussein who continues to reject UN recommendations for ordering adequate amounts of food and other basic humanitarian goods. Instead, he seeks to use the oil-for-food program to rebuild his army and export oil in order to build palaces and obtain luxuries for his family and regime supporters. Holds on inappropriate contracts help pre-vent the diversion of oil-for-food goods to further Saddam's personal interests.

    - Proposed oil-for-food contracts must be approved by all members of a committee made up of Security Council member states. Only a small number of such contracts are put on hold.

    - Since its inception, the Sanctions Committee has approved 94% of all requested oil-for-food goods. That is over $8.90 billion worth of contracts. The Sanctions Committee has put holds on less than 6% of the goods submitted to it. None of the contracts on hold are for food. Iraq now imports about as much food as it did before the Gulf War.

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- Over 9,200 contracts have been reviewed by the Sanctions Committee; all but 694 have been approved. Many of these 694 contracts are delayed pending receipt of additional information from the contracting companies.

- Iraq usually delays submission to the UN of the list of goods it wants to order during each six-month phase of the oil-for-food program until the last minute. In this way it tries to sneak in proscribed items by forcing the UN either to halt the flow of oil-for-food goods or to approve dubious contracts.

- The 448 contracts on hold as of August 1999 include requests for items that can be used to make chemical, biological and nuclear weapons. Many of these items are on the list described in UNSCR 1051, the list of goods which must be notified to and inspected by UNSCOM and the IAEA. As Iraq is not permitting either organization to perform its UN-mandated functions, there can be no assurance that Iraq would not divert these dual-use items.

- The most frequent reason for placing a hold on a contract is the information that accompanies the contract. There are currently over 250 contracts on hold because the technical information or the end-use information in the contract is insufficient to judge the dual-use potential of the ordered goods.

- The United States has placed a hold on over 200 contracts that include dual-use items. The Security Council has created a list of items which can be used to build weapons of mass destruction and which the Security Council has said must be monitored by UNSCOM or the IAEA. With Iraq blocking those agencies from performing these missions, it would be dangerous to allow dual-use items into Iraq.

- There are 55 contracts on hold which are destined for the Basrah refinery, where Iraq produces gasoil which it smuggles out of Iraq in violation of UN sanctions. The profits from this illicit trade are used by the government of Iraq to procure items prohibited by sanctions, including luxuries for members of Saddam's inner circle, and continued construction of elaborate palaces.

- The Iraqi government claims that sanctions prevent it from getting spare parts needed to repair its oil industry and that this is to blame for low production levels. The activities of the Basrah refinery prove that such claims are false. Clearly, Iraq has no problem getting spare parts for its oil industry. The problem is that the regime of Saddam Hussein prefers to pro-duce and export oil illegally, outside the oil-for-food program so that he can control the revenues and use them for his own personal aggrandizement.

- Since repairing the Basrah refinery, Iraq has steadily increased the amount of oil illegally exported via the Persian Gulf. Illicit oil exports averaged about 50,000 b/d for much of 1998, until they ended with the attack on the Basrah refinery in December of 1998. Iraq resumed exports in August of 1999. Smuggling reached 70,000 b/d in December and averaged about 100,000 b/d in January 2000. We estimate that Baghdad has earned more than $25 million in January alone. There is no evidence that any of this money has been spent to improve the humanitarian situation of the Iraqi people.

- There are 90 contracts on hold because we have information that they are linked to a company that is operating or has operated in violation of sanctions.

- The United Nations has reported that $200 million worth of medicines and medical supplies sit undistributed in Iraqi warehouses. This is about half the value of all the medical supplies that have arrived in Iraq since the start of the oil-for-food program. Saddam can move his troops and missiles around the country, but claims that he doesn't have enough transportation to distribute these medicines, even as he alleges that children are dying due to sanctions.

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- Despite reports of widespread health problems, the government has still not spent the full $200 million for medical supplies allocated under phase five of the oil-for-food program (which ended in May). Only 40% of the money was used to purchase medicines for primary care, while 60% was used to buy medical equipment.

- While the average Iraqi needs basic medicines and medical care, the government of Iraq spent $6 million on a gamma knife, an instrument used for complicated neurosurgery that requires extremely advanced training to use. Another several million was spent on a MRI machine, used for high-resolution imaging. Such exotic treatment is reserved for regime bodyguards and other members of the elite. This total of $10 million could instead have benefited thousands of Iraqi children if it had been spent on vaccines, antibiotics, and the chemotherapeutics necessary to treat the large numbers of children that are allegedly dying due to lack of medicine.

- Despite Iraqi obstructionism, oil-for-food has raised by 50% the daily caloric value of the ration basket and has steadily improved health care for Iraqis. Infrastructure repair in areas such as agriculture, electricity, and water and sanitation is being under-taken. Iraq has claimed it was unable to produce enough oil to meet oil-for-food ceilings because the UN refused to approve contracts for spare parts for its petroleum industry. The fact is that hundreds of millions of dollars of spare parts have been delivered and Iraqi oil production is expected to exceed pre-Gulf war levels.

  - Since the start of the oil-for-food program, of the 7,560 contracts received, 5,901, or 78.1%, have been approved. Their total value is $7.7 billion.

  - The UN has reported that, despite Iraqi claims of infant malnutrition, the government of Iraq has ordered only a fraction of the nutrition supplies for vulnerable children and pregnant and nursing mothers recommended by the UN and for which money has been set aside under the oil-for-food program. Only $1.7 million of $25 million set aside for nutritional supplements has been spent by Iraq. In the past eighteen months, Iraq has ordered no nutritional supplements.

  - Despite a 50% increase in oil revenues, Iraq has increased the amount earmarked for food purchases by only 15.6%.

  - Baghdad has reduced from $8 million to $6 million the amount allocated to the supplemental nutritional support program for malnourished children and pregnant and lactating mothers.

  - In Northern Iraq, where the UN administers humanitarian assistance, child mortality rates have fallen below pre-Gulf War levels. Rates rose in the period before oil-for-food, but with the introduction of the program the trend reversed, and now those Iraqi children are better off than before the war.

  - Child mortality figures have more than doubled in the south and center of the country, where the Iraqi government -- rather than the UN -- controls the program. If a turn-around on child mortality can be made in the north, which is under the same sanctions as the rest of the country, there is no reason it cannot be done in the south and center.

- Iraq is facing its worst drought in 50 years. As a result, the government is restricting the planting of rice and told farmers not to plant summer crops without permission from the Ministry of Irrigation. The water levels of the reservoirs supplying Saddam Hussein's region of Tikrit, however, were at normal seasonal levels, while the flow of water to the southern cities was dramatically lower than during the previous two years. Saddam is diverting water to serve his political objectives, at the expense of the general population.

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- Iraq is actually exporting food, even though it says its people are malnourished.

    - Coalition ships enforcing the UN sanctions against Iraq recently diverted the ship M/V MINIMARE containing 2,000 metric tons of rice and other material being exported from Iraq for hard currency instead of being used to sup-port the Iraqi people.

    - Baby milk sold to Iraq through the oil-for-food pro-gram has been found in markets throughout the Gulf, demonstrating that the Iraqi regime is depriving its people of much-needed goods in order to make an illicit profit.

    - Kuwaiti authorities recently seized a shipment coming out of Iraq carrying, among other items, baby powder, baby bottles, and other nursing materials for resale overseas.

        - Iraq has claimed it was unable to produce enough oil to meet oil-for-food ceilings because the UN refused to approve contracts for spare parts for its petroleum industry. The fact is that hundreds of millions of dollars of spare parts have been delivered and Iraqi oil production is expected to exceed pre-Gulf war levels.

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- Saddam celebrated his birthday this year by building a resort complex for regime loyalists. Since the Gulf War, Saddam has spent over $2 billion on presidential palaces. Some of these palaces boast gold-plated faucets and man-made lakes and waterfalls, which use pumping equipment that could have been used to address civilian water and sanitation needs.

    - In April 1999, Iraqi officials inaugurated Saddamiat al Tharthar. Located 85 miles west of Baghdad, this sprawling lakeside vacation resort contains stadiums, an amusement park, hospitals, parks, and 625 homes to be used by government officials. This project cost hundreds of millions of dollars. There is no clearer example of the government's lack of concern for the needs of its people than Saddamiat al Tharthar.

    - In July, Baghdad increased taxes on vehicle owner-ship and marriage dowries, after earlier increases in taxes, fees, and fuel and electricity prices. This is in part what pays for Saddam's palaces. Saddam also uses food rations, medical care, and other state resources to buy the loyalty of his inner circle and security forces.

- Iraq has refused to allow the UN's Special Rapporteur for Human Rights to return to Iraq since his first visit in 1992. The government of Iraq has refused to allow the stationing of human rights monitors as required by the resolutions of the UN General Assembly and the UN Commission on Human Rights. The regime expelled UN personnel and NGOs who, until 1992, ensured the delivery of humanitarian relief services throughout the country. Iraqi authorities routinely practice extrajudicial, summary or arbitrary executions throughout those parts of the country still under regime control. The total number of prisoners

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believed to have been executed since autumn 1997 exceeds 2,500. This includes hundreds of arbitrary executions in the last months of 1998 at Abu Ghraib and Radwaniyah prisons near Baghdad.

- In the 1970s and 1980s, the Iraqi regime destroyed over 3,000 Kurdish villages. The destruction of Kurdish and Turkomen homes is still going on in Iraqi-controlled areas of northern Iraq, as evidenced the destruction by Iraqi forces of civilian homes in the citadel of Kirkuk. In northern Iraq, the government is continuing its campaign of forcibly deporting Kurdish and Turkomen families to southern governorates. As a result of these forced deportations, approximately 900,000 citizens are internally displaced through-out Iraq. Local officials in the south have ordered the arrest of any official or citizen who provides employment, food or shelter to newly arriving Kurds.

- Iraq's 1988-89 Anfal campaign subjected the Kurdish people in northern Iraq to the most wide-spread attack of chemical weapons ever used against a civilian population. The Iraqi military attacked a number of towns and villages in northern Iraq with chemical weapons. In the town of Halabja alone, an estimated 5,000 civilians were killed and more than 10,000 were injured.

- The scale and severity of Iraqi attacks on Shi'a civilians in the south of Iraq have been increasing steadily. The Human Rights Organization in Iraq (HROI) reports that 1,093 persons were arrested in June 1999 in Basrah alone. Tanks from the Hammourabi Republican Guards Division attacked the towns of Rumaitha and Khudur on June 26, after residents protested the systematic maldistribution of food and medicine to the detriment of the Shi'a. Iraqi troops killed fourteen villagers, arrested more than a hundred more, and destroyed forty homes. On June 29, the Supreme Council for the Islamic Resistance in Iraq reported that 160 homes in the Abul Khaseeb district near Basra were destroyed.

- In March 1999, the regime gunned down Grand Ayatollah al Sayyid Mohammad Sadiq al Sadr, the most senior Shi'a religious leader in Iraq. Since 1991, dozens of senior Shi'a clerics and hundreds of their followers have either been murdered or arrested by the authorities, and their whereabouts remain unknown.

- In the southern marshes, government forces have burned houses and fields, demolished houses with bulldozers, and undertaken a deliberate campaign to drain and poison the marshes. Villages belonging to the al Juwaibiri, al Shumaish, al Musa and al Rahma tribes were entirely destroyed and the inhabitants forcibly expelled. Government troops expelled the population of other areas at gunpoint and also forced them to relocate by cutting off their water supply.

While Iraq's press called these charges a "desperate lie," there is little to indicate that they are anything but true.[326] Nothing has really changed since that time including most of Iraq's charges – which are endlessly recycled in spite of the flow of oil export revenues and oil for food deliveries.

In March 2000, the US released photos showing that Saddam Hussein had built a massive new headquarters for the MEK costing tens of millions of dollars. The photos show the main headquarters complex. was located in Falluja, is approximately 40 kilometers west of Baghdad. Construction was begun in late 1998 and is still going on. The site covered approximately six

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square kilometers and included lakes, farms, barracks; administrative buildings and other facilities. The facility can accommodate between 3,000 to 5,000 MEK members. When this headquarters complex becomes operational, it will be used to coordinate MEK terrorist activities and to plan attacks against targets in Iran and elsewhere.[327]

This did not stop the UN Sub-Commission on the Promotion and Protection of Human Rights from calling for the lifting of sanctions in a report in August 2000 – or following in the UN and other human rights group tradition of totaling failing to examine the history and nature of the actions of the Iraqi government or the probable real world impact of lifting all controls on Saddam Hussein's behavior.[328] It also did not stop Tariq Aziz from lying about the oil for food program, and charging that same month that Iraq had sold more than $30 billion worth of oil and had received only $8 billion worth of goods. (He said that the UN had deducted more than $9 billion for compensation and the "administrative costs of spies."[329]

Fortunately, the top leadership of the UN has been far more realistic and objective. UN Secretary General Annan has recognized the real suffering of Iraq's people and has called for "smarter sanctions."[330] His reports on oil for food, however, have also highlighted the problems in Iraq's behavior. He released a new report on the humanitarian oil-for-food program released September 11, 2000, and it describes the same unacceptable situation.[331] His report states that the Iraqi government continued to refuse to discuss arrangements for using oil-for-food funds to purchase Iraqi goods and services and to give visas for UN experts on this issue. It notes that Iraq executed contracts for approximately 360.9 million barrels of oil with an estimated value of $8,500 million during the first three months of the latest 180-day period, which began in June 2000.

The report also indicates that Iraq was able to increase the allocations for the food, nutrition and health requirements, allocating $498 million to the health sector -- a 63.3% percent increase. It increased target level of food to 2,472 kilocalories per person per day. (The report does not deal with Iraq's revenues from smuggled oil which goes out by tanker through Turkey,

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and which had tankers back up for lengths as long as 30 kilometers along the border in 2000.[332] It did not cover similar revenues from product smuggled out through the Gulf via Iranian waters – as was demonstrated by the seizure of the Russian tanker Volga-Neft-147 on February 2, 2000.[333]

At the same time, the report indicated that 70 percent of families bartered or sold some of the items in the food basket to obtain other essential goods. The World Food Program (WFP) also reported that Iraq's Umm Qasr port, the railways, trucks, and mills related to food production are "in a deplorable state" because of age, poor maintenance, and lack of spare parts. This was partly a result of sanctions but also of Iraq's delays in beginning work on replacing the mills and submitting applications to improve the warehousing and handling of humanitarian supplies including applications for trucks and forklifts. The report indicated that Iraq's infrastructure remained heavily incapacitated despite Iraq's recent ordering of essential equipment and supplies, often because Iraq kept complementary items have frequently been kept on hold long after the main items to go with them had been delivered.

The Secretary General's report also indicated that there had been a steep decline in health care more because of the departure of both foreign and Iraqi health professions, and difficulty in distributing medical supplies and medicines, that a lack of funds. It also found that education is one of the most intractable problems facing the country, and that school enrolment in the center and south of the country has dropped as families send their children to work to bring home needed income. In contrast, in the northern Kurdish provinces where the UN runs the humanitarian program, school enrolment has actually risen because of sustained rehabilitation of educational facilities, availability of school supplies, and general economic improvement, he reported.

In regard to the approval contracts, the Secretary General found that despite "the commendable efforts" made to reduce the number of contracts on hold, 647 contracts worth $1,500 million for humanitarian supplies and 504 contracts for oil and spare parts worth $279 million were on hold at the end of August, 2000. Most were on hold because nations have not

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responded to UN requests for clarifications on the contracts. The Secretary General also pointed out that the oil-for-food program did not allow for financial investments to rehabilitate infrastructure and that has placed limitations on what the program can do to deliver supplies and see they are used effectively. That limitation must be address "if the humanitarian challenge is to be met in full."

It seems clear that the present terms of UN sanctions should be changed both to provide a different kind of flow of oil revenues that will allow Iraq to develop and meet the needs of is people. Saddam will not act in the interest of his own people and Iraq must meet the requirements of Security Council Resolution 687 (paragraph 22) in order for the present UN sanctions on development and energy investment to be lifted. The resolution states that the oil embargo will continue until Iraq meets all the conditions that UN has set, including the destruction of all weapons of mass destruction such as nuclear, chemical and biological weapons and long range missiles.

Saddam Hussein has made it repeatedly clear that Iraq will resist such compliance. Iraqi officials repeatedly have stated that UN Resolution 986 should lead to an immediate and complete lifting of all UN sanctions against Iraq, and have repeatedly threatened to halt exports unless all sanctions are lifted. Iraq has also opposed any resumption of the UN inspection effort that halted in 1998, and continuing to pay reparations, and has opposed any real effort to measure the effects of the sanctions.[334] On September 10, 2000, Iraq refused Secretary General Anan's request to allow a neutral UN team into Iraq to assess its true level of hardship, even though this might have led to major relief on sanctions if Iraq's constant charges had proven correct.[335]

Unless some new approach is taken to sanctions, they will continue to block the development, economic recovery, and expansion of Iraqi energy and Saddam will be able to manipulate more and more oil for food money for immediate expenses in ways that are difficult to trace and where it is almost impossible to assess the true need and eventual use of the money.. A rigid approach to sanctions will continue to give the Iraqi regime a powerful oil weapon. As has

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been discussed previously, Iraq has signed lucrative oil and gas deals with companies from Russia, France, China in anticipation of the lifting of sanctions. The EIA reports that dozens of foreign oil companies from a wide variety of countries have been in discussions with the Iraqi government, and the Iraqi's have also invited foreign firms to invest in natural gas projects that are worth $4.2 billion

The Challenge of Iraq's Military Forces and Proliferation

Further military confrontations with Iraq are not a threat, they are an ongoing reality. Fortunately, Iraq has many military problems, some of which may help ultimately bring down its regime. The heavily politicized structure of Iraq's high command is one of them. Saddam bypasses or alters its formal structure as he pleases. The system emphasizes political loyalty and the security of the regime over military effectiveness. It is filled with checks and balances to ensure Saddam's safety, promotion emphasizes loyalty, and positions are regularly rotated to ensure that no officer develops enough personal loyalty to threaten the regime.

Iraqi defectors have made it abundantly clear that major procurement, deployment, organizational decisions are often made by Saddam and his personnel coterie with little staff work and professional review.[336] Saddam repeatedly bypasses the formal chain of command down to the small unit level, and major operational decisions are made on the basis of perceived loyalty or personal whim. Major procurement, technical, and industrial decisions are often made by Saddam on the basis of personal contact, and Saddam has often shown that the most ambitious promise brings more rewards than the real-world prospect of success. Loyalty and the image of success are more important than the reality of success, and many of Iraq's efforts are divided into secret compartments with little coordination of oversight.

Political control of the Iraqi military was a major part of the problem Iraq had faced in creating effective forces before and during the Iran-Iraq War. While Iraq has a formal command structure very similar to that of other regional military forces, with all the usual C^4I/BM (command, control, communications, computer/battle management) facilities, the Iraqi armed

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forces have been treated as much as if they were an instrument of state control as a means of national defense. They are a key tool in the ruling elite's efforts to secure means of power, to coerce the Kurds, and to suppress systematically any threat from Iraq's Shi'ites, and this has led to repeated tensions between Saddam and his more professional military officers.

It is difficult to confirm many of the details of Saddam's actions in asserting his control over the military. What does seem clear is that Saddam has continued his policy of shifting and rotating commanders to ensure that no group of military or internal security forces would become loyal to a potential rival. Saddam has also moved members of his family to senior positions, and ruthlessly purged any officer who became too suspect or acquired too much of a reputation for professional success.[337]

The Continuing Threat the Iraqi Military Poses to Saddam

There have been many reports of coup attempts, arrests, and executions from late 1991 to the present -- some of which involve the Juburi clan. For example, reports appeared in mid-September 1992 that Saddam Hussein had executed a total of 26-30 more officers, including General Abed Mutleq Juburi.[338] In October, he was accused of executing 19 more officers, including Brigadier Anwar Ismael Hentoosh and Brigadier Amir Rashid Hasson, two officers blamed for being insufficiently ruthless in putting down the Shi'ite rebellion in the south.[339]

Unconfirmed reports appeared of the execution or arrest of former Interior Minister Samir Abd al-Wahab al-Shaykhali in April 1993 and another series of arrests and executions of military officers and civilians took place during August through September 1993. These arrests and executions seem to have begun on August 20, 1993, and to have eventually involved a mixture of military officers and civilians associated with the Juburi clan, Ubayd clan, and Saddam Hussein's home town of Tikrit. Up to 100-150 men were involved, evidently including Jassim Mawlud Mukhlis and Saqr Mukhlis. Saqr was the son of the Mawlud Mukhlis who was the Tikriti landlord and the original patron who had opened up the officer corps to Tikritis under the monarchy.

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Another well known Iraqi executed was Brigadier General Raqhib Tikriti, a military physician who was head of the Iraqi Physician's Association.

While only uncertain reports of fighting and troop movements indicate a major coup attempt took place, there were reports that these arrests followed an effort to obtain Western support for a coup. These reports indicate that the plotters asked for Western air support over Baghdad and assurances that the Kurds would not seize Kirkuk and that Iran would not intervene in the south.[340] A number of US and British experts feel that these arrests were the result of a serious assassination attempt. Yet Saddam Hussein and the Ba'ath elite may have been reacting to threats that had not yet been transformed into plans. Saddam made little effort to lower his visibility, and continued to indulge in media events that seemed designed to show his wealth in spite of Iraq's growing economic problems.[341]

A new series of defections occurred in 1995 and 1996, as well as reports of bombings and fighting within military barracks. The most publicized defection was Hussein Kamel al-Majid, Saddam's son-in-law, a Lt. General, and the head of the Military Industrialization Commission and Special Security Service (Amn Al-Khass). Hussein Kamel's flight to Jordan in the summer of 1995, his return to Iraq, and his "execution" created a bizarre sequence of events that exposed both the extent of the internal conflicts within Saddam's family and the true scale of Iraq's chemical and biological warfare programs. Another senior officer, General Nizar al-Khazraji, a former chief of staff, fled to Jordan in late March 1996.

In late June-early July 1996, reports surfaced that Saddam Hussein survived another coup attempt by the military, which included a plan to assassinate the Iraqi leader. While it is difficult to sort fact from fiction, it seems that elements of the elite Republican Guards were involved, as well as officers from several other army corps. The group took the name of "The Popular Uprising Movement" (*harakat al-intifadhah al-sha'abiyah)*, and some reports indicate that it included a number of senior army officers who had decided to rid Iraq of Saddam and who felt Iraq's external opposition groups were impotent and subservient to foreign powers.[342] Other reports

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indicate that they had at least some backing from King Hussein of Jordan, the US, and the Iraqi National Accord -- a factor which allowed Iraqi security agents who had penetrated the Iraqi National Accord to warn Saddam.[343]

The Iraqi National Security Council seems to have set up a special committee headed by Qusay and with representatives of the General Intelligence Directorate (Mukhabarat), Military Intelligence Service (Al-Estikhabarat al-Askariyya), General Security Service (Amn al Amm), and Military Security Service (Al Amn al-Askariyya). Saddam seems to have given this group the power to make arrests regardless of family and tribal connection, and Qusay seems to have taken the lead in directing its operations.[344]

Scores of officers were detained. Some reports indicated that as many as 120-160 officers were arrested and held in Salamiyeh prison in Mosul. Other reports indicated that the total included 12 from the Republican Guards and three from the Special Republican or Presidential Guards. Three senior officers who were also provincial governors were arrested as well. The US State Department reports that some 400 officers were killed, including senior Republican Guard officers and Tikritis, and that Saddam's eldest son Uday supervised the implementation of his father's orders. It seems likely, however, that Qusay played at least as important a role.[345]

The Continuing Threat to the Regime from the Iraqi Military

In mid-July 1996, Saddam took the unusual step of making a regular army officer the commander of the Republican Guard, and of appointing a native of Mosul as his office chief-of-staff. This latter appointee was Awwad al-Bandar, the former head of Iraq's Revolutionary Court, and he seems to have been appointed to counterbalance the internal political impact of Saddam's earlier execution of several officers from Mosul.[346] At the same time, Saddam seems to have tightened his direct control of the "Special Republican Guard" he uses for his immediate security, increased its readiness and heavy equipment, and possibly strengthened its control over Iraq's surviving covert holdings of biological and chemical weapons and missiles.

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The coup and assassination attempts were followed by the Ba'ath regime's customary large-scale purges and dismissals of officers from clans or tribes suspected of dissident behavior. Once again, much of the regime's wrath fell upon officers from the Dulaim and al-Duri tribes of Al-Anbar province. Moreover, Saddam Hussein began to admit large number of officers from the Al-Sa'dun Sunni Arab tribe from Al-Basrah province into the Presidential Guards. Saddam also used his August 31 invasion of the Kurdish security zone to round up and execute Iraqi deserters. This included at least 96 deserters in one town outside Irbil. Ironically, the Revolutionary Command Council (RCC) issued a decree on August 5 suspending the use of amputation as a punishment for desertion. [347]

Since that time, there have been many other reports of military unrest, although none that seem to have reached levels as serious as those in the early and mid-1990s. Saddam's ability to use money made available by the "oil for food program" – which allows him to devote other revenues to the military – may have helped. Saddam has also carefully encouraged tribalism within the armed forces from those tribes he feels remain loyal or whose loyalty can be purchased. He seems to have changed and rotated many of the intelligence and security officers responsible for surveillance over the armed forces, and to have strengthened Qusay's role in controlling both the presidential security forces and reviewing security reports on all aspects of the Republican Guard and regular military forces.

Prospects for a Coup and "One Bullet Election"

There is little prospect that Saddam can ever fully secure his control over the military, or can ever eliminate the risk that an assassination or coup attempt will finally succeed. However, Saddam retains a massive apparatus to protect himself from the military, and continues to demonstrate that he can use the military as an instrument of state control. The Iraqi military continues to deploy nearly 14 of its 23-24 divisions along the border of the area under Kurdish control, and to deploy several divisions that conduct military operations against Shi'ite rebels in the marshes in the south.[348] Saddam has repeatedly demonstrated that he can deploy the

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Republican Guard for internal security missions, and that he can ruthlessly purge potential power centers within the military.

Moreover, the kind of opposition to Saddam that has surfaced within the military shows little sign of being "democratic." It is the product of clan-oriented struggles for power or a desire to preserve power by getting rid of a man that is perceived as the reason that sanctions continue. The military may be more "pragmatic" than Saddam, but it will only be as moderate as it has to be. The military will also inevitably use any increase in its political power to favor its own interests.

The Size and Character of Iraq's Military Efforts

One thing is all too clear, Iraq's economic hardships have not prevented its regime from continuing to mobilize much of its manpower pool and make heavy expenditures on military forces.[349] Iraq still has an active force structure with over 380,000 men, with the IISS reports showing 429,000. It has another 650,000 in reserve. It has 6-7 corps with 17-19 regular army divisions, six Republican Guard divisions, 7-10 Special Forces and commando brigades, and a Presidential Guard/special security force. Iraq's equipment holdings include roughly 2,200-2,700 tanks, 3,300-4,400 other armored vehicles, 1,980-2,100 major artillery weapons, 120 attack helicopters, and over 330 combat aircraft. Iraq has also made a major effort to rebuild its military industries and to compensate for its lack of arms imports with domestic production.

The readiness of Iraq's manpower, major combat formations, and equipment is uncertain. Iraq has slowly improved its training at the company and battalion level, has created cadres of officers with considerable training and experience, has reorganized its forces, and has repaired and overhauled much of its equipment. Nevertheless, more than half a decade without significant military imports is steadily reducing Iraq's military capabilities. While Iraq was able to rebuild and consolidate its forces after the Gulf War, its rate of recovery declined in late 1993 to early 1994. Iraq made little progress after this time until the fall of 1996, when it again began to increase its

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readiness and training activity. It also either obtained some imports of spare parts or made more effective use of existing stocks.[350]

Iraq's Military Expenditures and Arms Transfers Since the Gulf War

There are no reliable estimates of Iraq's military expenditures since the Gulf War, and such estimates are almost impossible to make because Saddam Hussein has used his control over Iraq's economy to shift assets to the military in ways that are not reflected in any Iraqi budget document.

The sources that are available indicate that Iraq was forced to make massive cuts in its military expenditures after the Gulf War. The US Department reports that Iraq's military expenditures totaled $35 billion in 1987, $33.2 billion in 1988, $25.5 billion in 1989, $26.4 billion in 1990, $2.0 billion in 1991, $2.0 billion in 1992, $2.0 billion in 1993, $1.5 billion in 1994, $1.3 billion in 1995, $1.25 billion in 1996, and $1.25 billion in 1997.[351] The International Institute of Strategic Studies (IISS) has produced different figures. It estimates that Iraq's military spending shifted from $11 billion in 1/88, to $2.5 billion in 1992, $2.6 billion in 1993, $2.7 billion in 1994, $2.7 billion in 1995, $2.7 billion in 1996, $1.3 billion in 1997, $1.3 billion in 1998, and $1.4 billion in 1999.[352]

These figures seem to severely understate the cost of Iraq's forces in terms that are comparable to other Gulf nations. They assume, however, that manpower costs are extremely low, do not include the opportunity cost of expending military equipment and ammunition without replacement, and ignore many of the real-world expenditures Iraq's makes on military forces in a command economy. Iraq simply does not pay market prices for many of its expenditures, or formally include them in its budget, because it has used low-paid conscripts and directly allocated state resources.

It is all too clear, that the Iraqi has continued to maintain an extremely large force structure for nation of its size and one that is extremely expensive. It is also clear that it has had to pay to keep these forces active in the field for much of the period since 1991 -- fighting with its

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Shi'ite opposition, surrounding the Kurds, and major exercises. These forces have had to be paid a premium to ensure their loyalty. As a result, Iraq's military expenditures have almost certainly been a massive economic burden for a nation that had only token oil exports during the first half of the 1990s. It has also had to pay a high economic opportunity cost to divert resources away from its civil economy.

If Iraq's efforts are costed from these perspective, Iraqi expenditures may have "cost" from $6 billion to $9 billion annually in terms of their dollar value equivalent. Many of Iraq's armed forces have been constantly involved in civil wars against the Kurds and Shi'ites, or in expensive field deployments near the Kurdish security zone in the north, and in the urban and marsh areas in the south. Iraq has poured massive resources into rebuilding its military industry, and trying to maintain its operational readiness. The government has also offered salary increases and other incentives that have become progressively more expensive with time. While no firm data are available, Iraq has probably spent about 33% to 45% of its post-Gulf War GDP on military expenditures in spite of the economic crisis created by the UN sanctions and Saddam Hussein's refusal to sell oil.

Fortunately, UN sanctions have had a major positive effect in limiting what the Iraqi regime can do. Until the Gulf War, arms imports served as Iraq's substitute for effective organization and military competence. Iraq's arms imports placed a major burden on Iraq's economy during the decade before the Gulf War and the beginning of UN sanctions. It was a massive flood of arms imports that kept Iraq alive during the Iran-Iraq War. Similarly, it was Saddam's refusal to accept major reductions in these arms imports that was a major factor in his decision to invade Kuwait. Ironically, the Gulf War had just the opposite effect.

Iraq has now been cut off from major arms deliveries for well over half a decade. It has been unable to modernize, react to many of the lessons in the Gulf War, match the military build-up of its neighbors, and deal with the 'revolution in military affairs.' It has also been unable to use

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arms imports as a substitute for effective maintenance and repair capability, or for an effective logistics system.

Iraq has also faced growing problems with obsolescence and wear. While Iraq was able to recover and rebuild substantial amounts of the military equipment it left behind on the battlefield after the Gulf War, it has since had to fight against its Shi'ites, maintain extensive field deployments against its Kurds and Iran, and attempt to rebuild its fighting capabilities through major exercises. The end result has been continuing wear coupled with the growing obsolescence of Iraq's older equipment, and the build-up of a cumulative backlog in the recapitalization of its forces that now total nearly $20 billion.

Iraq took delivery on $29.7 billion worth of new arms during the latter half of the Iran-Iraq War -- the period from 1984-1988. These deliveries included $15.4 billion worth of arms from the former Soviet Union, $0.75 billion from Poland, $0.65 billion from Bulgaria, $0.675 billion from Czechoslovakia, and $2.8 billion from the People's Republic of China. Iraq obtained $3.1 billion from France, $0.37 billion from Italy, $0.03 billion from the UK, $0.675 billion from Germany, and $5.2 billion from other countries.[353] Iraq's arms imports then vastly exceeded those of Iran and rivaled those of Saudi Arabia in total cost.

Iraq had good reason to reduce its arms imports following the cease-fire in the Iran-Iraq War. Iraq had immense debts and badly needed funds for civil development and reconstruction. Iraq's victories over Iran during the spring and summer of 1988 had cost Iran 40-60% of its major land force weapons. Iraq had captured 1,000s of Iranian tanks, other armored vehicles, and artillery weapons that had been abandoned on the field, many with little or no combat damage. Iraq also had an immense backlog of orders it had placed during the peak of the fighting and which were scheduled for delivery during 1988-1992.

The size of the backlog of Iraqi arms orders after the Iran-Iraq War is indicated by the fact that Iraq took delivery on $5.0 billion worth of arms during 1989-1990, including $1.5 billion worth of arms from the former Soviet Union, $400 million from the People's Republic of China,

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$2.1 billion from major West European states, $600 million from other European states, and $400 million from other countries.

Iraq ordered $1.7 billion worth of arms from the end of the Iran-Iraq War in August, 1988, to the beginning of the embargo on arms shipments that followed its invasion of Kuwait in August, 1990. It would also have ordered much more, however, if it had been able to make some strategic choices between civil development or "butter" over military power or "guns." It is quite clear from both intelligence sources and interviews with Iraqi defectors that Iraq's low rate of new arms orders after 1988 was forced upon Saddam Hussein and his coterie by the nation's growing economic crisis.

Iraq's leaders still felt threatened by Iran. Their reasoning was based on the fact that the cease-fire was not a full peace, and Iran had a backlog of new arms orders of its own. Iran took delivery on $1.4 billion worth of arms a year during 1989-1990. More importantly, Iran began to place major new orders of a size that indicated that it was actively attempting to make up for its equipment losses. Iran placed a total of $6.7 billion in new orders during 1989-1992, and continued to remain on the "top ten" arms buyers list. In contrast, Iraq was forced to drop off of the "top ten" list for the first time in a decade.[354]

There were other strategic pressures from an Iraqi perspective. Iraq's leaders saw the US as a potentially hostile power that did not belong in the Gulf, that had betrayed Iraq in the Iran-Contra arms deal, that had only backed Iraq to checkmate Iran, and that was turning on Iraq now that Iran was no longer the primary threat. They saw Israel as a nuclear threat to Iraq, and Iran's search for weapons of mass destruction as a potentially existential threat.

Iraq's leaders were involved in an incredibly expensive program to develop and mass produce biological, chemical, and nuclear weapons and long-range missiles. They were committed to maintaining an immense military machine that needed roughly $900 million to $1.2 billion a year worth of spares, replacements, and upgrades a year -- even given the much lower requirements of peacetime operations. They wanted to complete the conversion of Iraq's military

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forces to more advanced weapons and technology similar to the kind of first line equipment used by NATO European forces and Russia. They were particularly concerned with creating an air force using the latest French and Russian aircraft, with upgrading Iraq's obsolescent surface-to-air missile force, and with expanding and modernizing Iraq's Republican Guard and regular heavy divisions with advanced tanks, armored combat vehicles, and self-propelled artillery.

Iraq's leaders realized that new orders averaging less than $1 billion a year were only about one-third to one-half what they needed to meet their goals. The most they could do under the circumstances was to prioritize their new order to focus on modern high technology equipment. This helps to explain why $500 million of the $1.7 billion came from major West European states, $100 million from other European states, and $200 million were ordered from the Soviet Union. In contrast, no new orders were placed with the People's Republic of China, although Iraq ordered $900 million worth of new military imports from other countries. Some of the latter orders were designed to resupply and sustain Iraq's existing equipment at the lowest possible cost, some were part of an effort to obtain high technology systems from third parties, and some were dual used imports designed to help develop and produce weapons of mass destruction.[355]

At the same time, these pressures steadily increased the tensions between Iraq's leaders and their Southern Gulf neighbors. Saddam and his supporters saw Iraq as the natural military leader of the Gulf and as the emerging leader of the Arab world. They felt that continuing aid to Iraq was a legitimate obligation on the part of the wealthy Gulf states like Kuwait, Saudi Arabia and the UAE that had stood aside from the fighting in the "Arab cause" against Iran. They felt that Iraq's wartime debts should be treated as aid, and not as a financial burden that helped to crippled Iraq's military modernization.

Iraq's invasion of Kuwait was partly a result of these perceptions and pressures and the resulting ironies are obvious. The invasion scarcely met its goals of relieving Iraq's financial problems and consolidating its role as the dominant military power in the Gulf. Instead, Iraq has

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had no major arms deliveries since it invaded Kuwait, and has been unable to place any major orders.[356] It has only had limited and erratic deliveries of "black market" parts and munitions, none of which have been significant. US government unclassified estimates report than Iran had less that $50 million in new conventional arms orders and deliveries between the time sanctions were imposed and the end of 1999.[357]

The Gulf War has now Iraq much of its butter as well as most of its guns, and has created far greater and longer-term problems in financing a military machine than would ever have been the case if Iraq had focused on recovery and renegotiated its debts. As Figure VI-1 shows, estimates indicate that Iraq's GDP would have risen to $35-40 billion in 1990, if it had not invaded Kuwait. Instead, it dropped to around $25 billion. Any estimate of Iraq's GDP after 1990 is speculative, but it seems to have been about $24 billion in 1991, $20 billion in 1992, and substantially less than $20 billion in 1993. Estimates of Iraq's total foreign debt in 1993, including interest, range from $80 billion to $109 billion.[358]

An arms cut off also had a special impact on Iraq's military effectiveness. The arms embargo that the UN imposed in August 1990 meant that Iraq suddenly ceased to be one of the largest importers in the Gulf and became one with only token imports -- lagging behind even the smallest Southern Gulf states. Virtually without warning, Iraq was cut off entirely from access to several of its most important pre-Gulf War suppliers after 1990.

This imposed a considerable shock on the Iraqi military machine. It had never organized effectively to support and repair its equipment before the Gulf War. It could not deliver the complex mixes of spare parts required by modern military technology in an orderly and efficient fashion, and it had solved many of its logistic and resupply problems by flooding the Iraqi military forces with new imports and entire replacements.

While many of Iraq's internal supply, logistic, and repair capabilities have slowly improved, UN sanctions have had steadily more impact on a military force structure that required a minimum of $900 million to $1.2 billion in pre-Gulf War military imports in order to sustain its

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existing readiness, sustainability, and effectiveness. Even when Iraq's more sophisticated military equipment is still operational, it often has limited sustainability and/or partial repair and maintenance means that sub-systems do not work or have no endurance in combat. Iraq's efforts to substitute for imports with domestic modifications and production to its major weapons systems have also had only very limited effectiveness.

If Iraq's need for military modernization is included in the cost estimate, it would have required about $2-2.5 billion a year worth of arms deliverers to sustain Iraq's forces, modernize its conventional forces, and support its efforts to deploy large numbers of long-range missiles and weapons of mass destruction. As a result, the cumulative impact of the Gulf War and UN sanctions has been devastating. Even if one ignores the cost of replacing Iraq's wartime losses, Iraq's military imports were underfunded by at least $8 billion between 1990 and 2000. Sustaining Iraq existing force structure, replacing its wartime losses, and modernizing its military forces would have cost at least $3-4 billion a year after 1991, and the cumulative gap between Iraq's ambitions and its actual military imports between 1991 and 2000 totals at least $21-25 billion.

The scale of Iraq's "recapitalization" problem is indicated by the amount of money Iraq might have spent on arms between 1991 and 1998 if it had not been under UN sanctions. If Iraq had imported arms at its average annual rate during the period from 1985-1990, it would have had to spend a total of $47.5 billion, nearly half of the oil export earnings it might have received if sanctions have been lifted. A conservative estimate of the cumulative cost of simply modernizing Iraq's existing military forces at the time of the Gulf War would total $21.6 billion, and it would have cost a minimum of $ 12 billion simply to keep Iraq's military machine from deteriorating. In contrast, a conservative estimate of the cumulative cost of modernization, and moderate force restructuring to react to the lessons of the Gulf War, indicates that Iraq would now have to spend at least $26.7 billion on military imports to react to the cumulative impact of sanctions.

Iraq's holdings of obsolete and obsolescent equipment now total 60-70% of the entire inventory in the Iraqi army, air force, and air defense force, and virtually every combat system in

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the Iraqi Navy except for some of its anti-ship missile forces. By this standard, sanctions have been anything but a failure. They have serious weakened Iraq's military forces, and it will take Iraq at least half a decade to compensate for the resulting problems once sanctions are lifted.

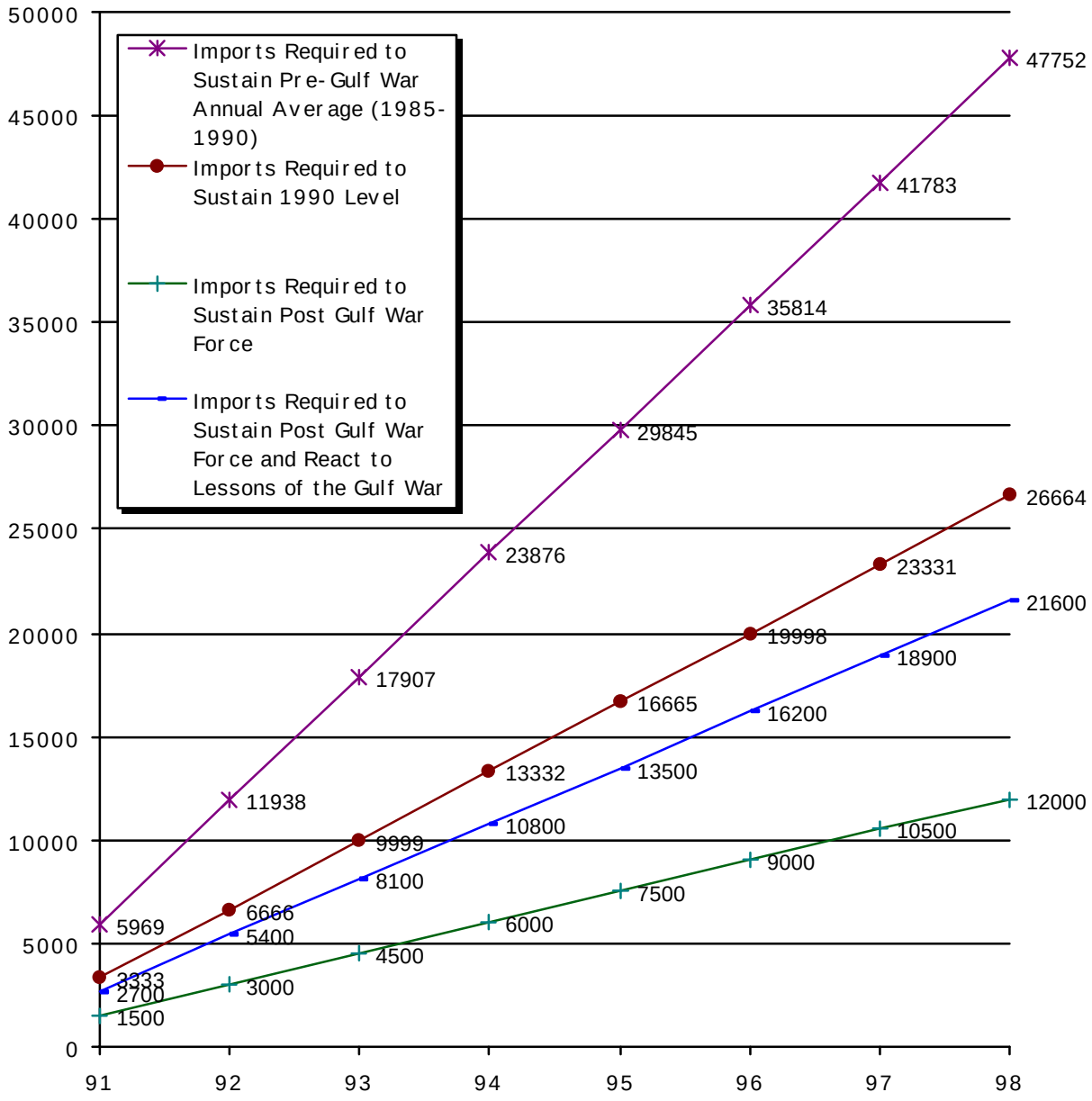
While Iraq did step up its smuggling of spare parts after late 1996, and sustained this level of effort during 1997 and 1998, its military consolidation has come almost solely through cannibalizing its pre-Gulf War equipment and stocks and equipment and spare parts. Iraq has been unable to "recapitalize" its forces by importing major deliveries or new equipment or producing advanced weapons systems in Iraq. Iraq has not been able to imports the technology it needs to react effectively to the lessons of the Gulf War and make up key wartime losses, and has not been able to import or manufacture the massive deliveries of parts, new equipment, and munitions it needs to make up for the inefficiency of its maintenance and logistics capability. [359] Nevertheless, the quality and strength of most units have declined sharply, and even Iraq's elite units have suffered. Iraq has had to cannibalize equipment and take equipment out of some units to maintain the readiness of others.[360]

It is important to note, however that these problem are still relative, when measured by the standard set by Iran and by the effectiveness reached in Southern Gulf forces. Iraq is anything but a paper tiger, but it is hardly the military power that won the Iran-Iraq War. Some areas of Iraq's order of battle is becoming a hollow shell. In those areas where Iraq has consolidated its resources effectively, its forces still have to deal with the fact that UN sanctions are denying Iraq the new technology, new equipment, and spare parts it needs. Iraq has lost one aspect of the "war of sanctions. It is steadily reducing the conventional military threat Iraq can pose to Iran, Kuwait, and other states.

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Figure VI-1

The Iraqi Cumulative Arms Import Deficit Enforced by UN Sanctions
(Measured in $US 97 Constant millions)



Source: Adapted by Anthony H. Cordesman from US Arms Control and Disarmament Agency, World Military Expenditures and Arms Transfers, 1995, GPO, Washington, 1996, and US State Department, Bureau of arms Control, World Military Expenditures and Arms Transfers, 1998, GPO, Washington, 2000.

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The Iraqi Army

There are a number of different estimates of the current strength of Iraqi land forces. US experts indicate that the Iraqi Army had a total of around 375,000 full time actives (including 100,000 recalled reserves) in 2000, and a total of seven corps, with two Republican Guards corps and five regular army corps. Iraq had a total of 23 divisions. These divisions included six Republican Guard divisions (3 armored, 1 mechanized and 2 infantry) and 1 Presidential Guard/Special Security Force division. There were also 15 independent special forces or commando brigades.

US experts indicate that the land forces had a total of fourteen divisions in the north, three divisions in central Iraq, and six divisions south of An Najaf. The Republican Guards had a total of three armored divisions deployment in the vicinity of Baghdad -- one near Taji, one near Baghdad, and one near As Suwayrah. These estimates seem to provide the most accurate current picture of Iraqi strength. [361]

Earlier estimates by USCENTCOM are somewhat similar, but indicate the Iraqi land forces had a total strength of 700,000 personnel including reserves. These estimates indicates that Iraq's major combat formations include 17 regular army divisions (6 heavy and 11 light), and 6 Republican Guards Divisions (3 heavy and 3 light). USCENTCOM also estimated that the total Iraqi Army order of battle included six armored divisions 4 mechanized divisions, 10 infantry divisions, 2 special forces divisions, 1 Special Republican Guards or Presidential Guard Division, 19 reserve brigades, 15 People's Army Brigades, and 25 helicopter squadrons. [362] Both sets of estimates gave Iraq a total force of approximately 23 divisions versus 35-40 divisions in the summer of 1990, and 67-70 divisions in January 1991 -- just before the Coalition offensives began in the Gulf War. [363]

USCENTCOM and other US experts estimated that Iraqi divisions had an authorized strength of about 10,000 men, and that about half of the Iraqi 23 divisions had manning levels of around 8,000 men and "a fair state of readiness." Republican Guards Divisions had an average

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strength of around 8,000 to 10,000 men. Brigades averaged around 2,500 men -- the size of a large US battalion. USCENTCOM also indicated that Iraqi army company and battalion level training increased significantly after November-December 1996. [364]

USCENTCOM experts indicated that Iraq's 23 divisions were arrayed north-to-south in February 1997, with a mix of regular and Republican Guards divisions. All of the divisions near the Kuwait border were regular, although some Republican Guard divisions could more to the border relatively rapidly. All Republican Guards divisions were located above the 32 degree line. Several additional Republican Guards divisions were located around Baghdad to play a major role in internal security. Several more Republican Guards divisions were located north of Baghdad closer to the Kurdish area. [365]

A total of twelve Iraqi divisions were effective enough to be used in an attack on Kuwait or combat operations against Iran. There were five regular divisions -- three relatively combat-ready -- in the southern border region north of Kuwait. There were two Republican Guards divisions that could be rapidly deployed to support the three more capable regular divisions in an attack on Kuwait which USCENTCOM labeled the "Basrah breakout."[366]

The IISS estimates that the Iraqi army had some 375,000 actives in later 2000, including 100,000 recalled reserves, plus over 600,000 reserves. It also estimates that Iraq has seven corps headquarters, six armored and mechanized divisions, 12 infantry divisions, six Republican Guard Force divisions, four special Republican Guard Brigades, seven commando brigades, and two special forces brigades.[367]

The Republican Guards are Iraq's most effective land forces and the most effective land forces in the Gulf region, although their combat capability must be kept in perspective. Iraq's regular army heavy divisions scored many of Iraq's defensive victories during the Iraq-Iraq War, and many of the breakthroughs and victories in the last months of the Iraq-Iraq War. Nevertheless, the Republican Guards did fight well in many battles in the Iran-Iraq Wars and the

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Gulf War, and spearheaded Iraq's invasion of Irbil. Like the Soviet Guards and Waffen SS, they may not be more effective than the best regular army units, but they must be taken very seriously.

Iraq has consolidated its Republican Guards forces down from a total of 12 divisions to a current total of six divisions equivalent since the Gulf War, and has eliminated a number of smaller formations. In the process, it has given the Republican Guards units priority in terms of equipment, resupply, training, and operational funding. This has increased the gap between the Republican Guards units and regular army units in material terms, although the warfighting results are untested.

In late 2000, the Republican Guards divisions included three heavily armored divisions (the Al Nida division, the Hammurabi division, and the Al Medina al Munawarrah division), and two lighter divisions (the Nebuchadnezzar division and the Baghdad division.) Two special forces brigades seem to have survived from the pre-war special forces division. There are a number of other independent infantry formations. [368]

According to US and Israeli experts, the surviving Republican Guards have a total of between 60,000 and 80,000 men, and 26-30 brigade equivalents (7 armored, 4 mechanized, and the rest infantry). This total manning indicates that Republican Guards have about 65-75% of the total manning needed for their combat units, and about half the total manpower needed to deploy and sustain a force of seven full divisions.[369] This is an indication that Iraq continues to have some manpower problems with even its most prestigious force. The Al Adnan Mechanized Division in the Northern Corps area has also had to be strengthened by consolidating the manpower and equipment of the Al Abed Infantry Division, based at Kirkuk, into the Adnan Division.[370]

US experts note that some of the forces for coup attempts have come from the Guard, that pay and privileges for junior officers and other ranks have declined in real value since late 1993, and that more Shi'ites and non-Takritis are being recruited into the force. Further, Saddam Hussein increasingly seems to be attempting to ensure the security of the Republican Guards by

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tribalizing the command and manning structure to mix “loyal” tribes in ways that emphasize tribal loyalty to Saddam while ensuring that units have a wide enough mix of tribes so that no tribal element might serve as a basis of a coup attempt.

There is also a division-sized “Special” or “Presidential” Republican Guards force, under a military command structure reporting directly to Saddam, that acts as a palace guard. This force is deployed in a number of battalions whose mission is to protect Saddam Hussein. It is largely infantry, but has some T-72s, BMPs, D-30s and 122 mm artillery weapons. Reports of its strength are uncertain, but one report claims a strength of some 13 battalions and 26,000 men. It is deployed in units which guard Saddam’s palaces, guard his movements, and provide emergency response forces. These emergency response forces may include a brigade-sized unit to provide Saddam with personal protection if he is threatened by some element of Iraq’s military forces. [371] The "Special Republican Guard" is quite different from the regular Baghdad-based Republican Guard division. The former has three brigades which guard the southern, northern and western arteries into the city.

Saddam’s son Qusay is the effective commander of this force, just as he is of the regular Republican Guards. If the regular Republican Guards act as the “ring” of forces that defends Baghdad and Saddam Hussein, the Special Republican Guards act as Saddam’s last line of defense. According to one report, Qusay has also set up a Joint Operations Room in the Presidential Palace, under the Iraqi National Security Council, to coordinate the operations of the Special Republican Guards with the Republican Guards and the key paramilitary elements of Iraq’s security forces. These paramilitary units include the Amn Al-Khass Brigade in the General Security Service, a “brigade” in the General Intelligence Directorate, a paramilitary formation in the Military Security Service, and a “battalion” in military intelligence.[372]

There is also a formation called the Fedayeen Saddam (Saddam’s Men of Sacrifice that reports directly to the palace, although its strength and status is unclear. Saddam’s other son, Uday formed this force in 1995, and some reports of its strength go as high as 40,000. It seems to

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consist more of young thugs than a paramilitary force, and its members carry out “patrols” that often amount to little more than extortion and terrorism of any potential opposition. It seems to report to the Presidential Palace and to now be under the control of Qusay.[373]

The equipment holdings of the surviving Republican Guards units are almost impossible to estimate, but they seem to be about 66%-75% of their prewar size. A rough estimate of the total equipment holdings of the Republican Guards would be around 650-800 tanks (at least 550 T-72s), 800-1,100 other armored vehicles (about half BMP 1/2s and 25% MTLBs), and 350-500 artillery weapons. Unlike other Iraqi Army units, these equipment holdings have also been kept largely operational since 1993, largely by consolidating operational equipment out of other combat and support units.

Most estimates of Iraq’s tank strength credit it with around 2,200-2,700 active main battle tanks, although it is not clear what portion of this total is really fully operational. An estimate by other US experts indicates that Iraqi Army's major equipment holdings included about 2,200-2,700 tanks, substantially less than half of the 6,700 tanks it had before the war. About half these tanks were T-54s, T-55s, T-59s and T-69s. Iraq also had about 600-700 M-48s, M-60s, AMX-30s, Centurions, and Chieftains captured from Iran or which it obtained in small numbers from other countries. The IISS estimates that Iraq has roughly 1,000 T-54, T-55, T-77 and Chinese T-59 and T-69 tanks, plus 200 T-62s, and 700 T-72s. It also estimates that Iraq has some Chieftain and M-47 and M-60 tanks it captured from Iran, most of which are inoperable.

One thing is certain. Iraq lost much of its pre-war T-72 strength during the Gulf War. US experts feel that only about 500-600 T-72s and 200-300 T-62s remained after the war, versus nearly 1,500 T-72s and T-62s before the war. According to some estimates, less than 2,200 of Iraq's tanks are fully operational. Iraq has retained over 1,500 tank transporters and heavy vehicle trailers out of the several thousand it bought during the Iran-Iraq War, and has continued to make effective use of them during exercises.[374] Iraq does, however, have a poor history of field repairs for tanks, and of aggressively attempting to recover and repair tanks in battle.

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Iraq's current doctrine and tactics for using these tanks is unclear. In the past, Iraqi corps and division commanders often set personal standards for training and employing tanks, tailoring them to the specific battlefield conditions they encountered. This worked well during the Iran-Iraq War when selected, battle-experienced unit commanders who were given the time to withdraw from the front, retrain, and exert their own initiative. It also worked well when Iraq had the initiative against slow moving, infantry-dominated Iranian forces, and could attack using pre-planned and well rehearsed attack plans against a relatively static and slow-reacting enemy. These techniques also compensated for Iraq's poor performance and readiness in combined arms and joint operations.

Iraqi armor was almost totally unprepared for the kind of AirLand battle it encountered during the Gulf War, however, and for the rapidly moving US Army forces it encountered during the Gulf War. Iraqi tanks showed little ability to deal with anti-tank weapons like the TOW during the battle of Khafji. Iraq was never able to commit most of its best regular army armored and mechanized tank units effectively to the defense of the forward area and then had to rush the surviving elements out of the Kuwait Theater of Operations. Even the Republican Guard tank units had to retreat or attempt to fight from ambush without adequate forward scouting and combined arms support. They were almost totally unprepared for the M-1A1's ability to locate Iraqi tanks at long-ranges and fire effectively using nothing more than the "hot spot" on their thermal vision devices, or the threat posed by similar systems on the AH-64. Even when Iraqi tanks did encounter US Army units at shorter ranges, they were not able to engage rapidly enough to avoid massive losses or inflict significant damage.

Experts estimated that Iraq has some 3,500 other armored vehicles in.[375] Iraq had 1,600 armored reconnaissance and command vehicles (BDRM-2, EE-3, EE-9, AML-60, AML-90, MTLB) versus 2,500 before the war. It had 800-900 armored infantry fighting vehicles (BMP-1, BMP-2, and AMX-10P) versus 2,000 before the war, and 2,300 armored personnel carriers (BTR-50, BTR-60, BTR-152, OT-62, OT-64, MTLB, YW-531, M-113, M-3, EE-11) compared to approximately 7,100 before the war.[376]

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The IISS estimates that Iraq retains some 900 BMP-1 and BMP-2 armored fighting infantry vehicles, plus an unknown number of BRDM-2, AML-60, AML-90, EE-9 Cascavel, and EE-3 Jararaca reconnaissance vehicles. It is estimates that Iraq still has about 2,000 armored personnel carriers, including BTR-50s, BTR-60s, BTR-152s, OT-62s, OT-64s, MTLBs, YW-532s, M-113A1s, M-113A2s, Panhard M-3s, and EE-11 Urutus.[377]

Regardless of their number, it is clear that Iraq faces a logistic and maintenance nightmare in supporting so many types of vehicles with such different firepower, mobility, and endurance. Many of these weapons are old or obsolete, and cannot keep up with tanks. Many are also deadlined due to lack of spares or have only limited operational capability. Furthermore, Iraq is forced to equip its heavy divisions with different mixes of armor, with different maneuver capabilities and often with different training requirements for both the weapons crew and maintenance and support teams. It also has difficulties in ensuring that its infantry can keep up with its tanks.

Iraq's surviving artillery includes about 1,900-2,005 major artillery weapons in late 2000. It has 1,500-1,800 towed artillery weapons (105 mm, 122 mm, 130 mm, and 155 mm), and around 150 to 250 self-propelled artillery weapons (2S1 122 mm, 2S3 152 mm, M-109A/1/A2 and GCT AUF-1 155 mm). A significant number of these self-propelled weapons may not have been fully operational. These totals compare with Iraqi holdings of 3,000-5,000 towed weapons, and 500 self-propelled tube weapons before the war. In addition, Iraq had some 4,000-5,000 (60 mm, 81 mm, 120 mm, 160 mm) mortars.

The data on Iraq’s holdings of multiple rocket launchers are too contradictory to make any estimate of wartime losses possible, but it is clear that many such weapons were destroyed or abandoned in the Kuwaiti Theater of Operations. Iraq now retains at least 120-140 such weapons (240 mm, 140 mm, Astros I, Astros II, BM-21, 122 mm), and may have over 270. Iraq also seems to retain many of its pre-war holdings of the FROG surface-to-surface rocket launchers, and at least several hundred rockets.[378]

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It is obvious from Iraq's artillery holdings that most units rely heavily on towed weapons, and that Iraq can only equip a few of its heavy combat units with the self-propelled artillery necessary to keep up with Iraqi tanks and Iraq's most modern other armored vehicles. Iraq has tried to solve these problems in the past by mixing tactics and artillery organization borrowed from France, Russia and China, and tailoring the end result to a given front or campaign. The end result, however, has rarely been impressive. Only a few Iraqi units have had the radars, training, and organization to allow them to conduct effective counter-battery fire. Targeting and observed fire is heavily dependent on forward observers, and is often slow and unresponsive. The ability to use RPVs and other techniques to acquire targets beyond visual range is very limited, and artillery support of mobile Iraqi armored units has been consistently poor -- even when the forward armored unit has called in targets and requested support.

Iraq has developed effective techniques for digging in towed weapons and massing tube and multiple rocket fire against slow-moving targets like Iranian infantry. It has not, however, demonstrated the ability to quickly shift fires and deal with rapidly moving armored forces. Its towed artillery has been relatively slow-moving and has often been road bound, unless sufficient time existed to support rear areas. During the Iran-Iraq War, Iraqi artillery units usually needed extensive time to deploy large amounts of ammunition into prepared rear areas in order to maintain high rates of fire, and had to pre-survey the battlefield to mass artillery fire effectively. Iraq also relies heavily on the "feed forward" of large amounts of ammunition, without prior request from the user unit, to make up for its slow-moving and unresponsive logistic and support system.

Iraqi self-propelled artillery units have often had problems extracting themselves from prepared positions, and moving rapidly under defensive conditions. Field repair and recovery of artillery systems has been poor.

The Iraqi Army lost large numbers of its anti-tank weapons during the fighting, many of which were recovered intact by the UN Coalition forces. Nevertheless, Iraq retained substantial

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anti-tank warfare capability. Its guided weapons include an unknown number of HOTs, AS-11, and AS-12s mounted on PAH-1 and SA-342 helicopters and AT-2s mounted on Mi-8 and Mi-24 helicopters. It has Milan and HOT launchers mounted on VC-TH armored vehicles; Soviet AT-1, AT-3, AT-4 crew-portable anti-tank-guided missiles; and Milan man-portable anti-tank guided missiles. It has several thousand 85 mm and 100 mm anti-tank guns and heavy recoilless rifles.

Iraq has rarely employed these weapons well. Even during the Iran-Iraq War, it tended to rely on tanks and massed artillery. During the Gulf War, it showed little understanding of the range at which modern Western armored can engage, the rate of advance and scale of maneuver of modern well-led armor, the impact of night and poor weather warfare in limiting crew served weapons without night vision aids, the need to rapidly maneuver crew served weapons rather than rely on static positions, and the need to conduct constant actual training firings of such equipment to develop and maintain proficiency. Iraq also was unprepared for the rapidly moving precision of Coalition artillery and the ability of helicopters and tanks to bypass prepared defenses using such weapons.

There are definitional problems in counting Iraq's surviving anti-aircraft guns because some estimates include machine guns, while others only include heavier weapons. Pre-war estimates put the total number of weapons including machine guns at around 7,000, and the number of heavier weapons at 4,000. Iraq lost substantial numbers of self-propelled anti-aircraft guns during the Gulf War, but it seemed to retain 300-500 heavy weapons, including some AMX-30 SAs, Egyptian-made guns and light missile launchers, and 150-200 radar-guided ZSU-23-4s. Iraq retained 4,000-5,000 other anti-aircraft guns -- although many may not be operational or may be deployed as anti-infantry weapons. This gives it a total of approximately 5,500 weapons, but such estimates do not include losses during or after the US-British air campaign operation in Desert Fox in December 1990.

There are few details available on Iraqi Army surface-to-air missile holdings, although they clearly included thousands of light and medium surface-to-air missiles. These included SA-7, SA-

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8, SA-9, SA-13, SA-14, and SA-16 vehicle-mounted, crew-served, and man-portable weapons, and perhaps 50-100 surviving Roland fire units on self-propelled armored vehicles. According to most estimates, Iraq retained at least 50-66% of its pre-war anti-aircraft weapons strength, or around 3,000 light surface-to-air missile launchers before Desert Fox. Estimates are not available of its losses since that time.

Iraq's holdings of such equipment, and skill in deploying and using it, is of critical importance because of the ability of the US, British, and Saudi Air Forces to use electronic warfare, precision location systems, stand-off ordnance, stealth, and anti-radiation missiles to suppress Iraq's larger radar-guided surface-to-air missiles. Iraqi Army units did have some success in using systems like the SA-8 and shorter-range air defense missiles, and "curtain fire" from anti-aircraft guns, to force Coalition aircraft to operate at stand-off ranges during parts of the Gulf War. In general, however, Coalition helicopters took very limited damage and losses, and Iraqi crews rarely made effective use of the radars on their shorter-range air defense missiles because of the fear of being hit by Coalition aircraft. Iraq has also never been able to hit a single US or British aircraft since that time.

Iraq would need much larger numbers of the most advanced short-range air defense systems to make a major change in this aspect of its capabilities. It would also need to change its training and acquisition and tracking equipment to emphasize the use of infra-red and very short bursts of radar activity restricted to firing under optimal conditions to either break up attacks or hit aircraft after they delivered their munitions. It is unclear that such techniques would be highly effective in any case, but this would require a level of operations research, organization and training, and fire discipline that Iraq has not exhibited in the past.

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Estimates of Iraqi operational helicopter strength are equally uncertain. In late 2000, Iraqi Army aviation seemed to possess about 120 armed helicopters out of the 159 it had before the war. These included 20 PAH-1 (Bo-105); attack helicopters with AS-11, AS-12 and HOT missiles, 30 Mi-24s and Mi-25s with AT-2 missiles, 40 SA-342s with AS-12s and HOTs, Allouettes with AS-11s and AS-12s, and 5 SA-321s with Exocet.

No reliable estimate exists of the number of surviving heavy, medium, and light transports and utility helicopters, but it seems likely that Iraq retained 200-300.[379] The IISS estimates that Iraq has roughly 350 transport helicopters, including Mi-6 heavy helicopters, AS-61, Bell 214ST, Mi-4, Mi-8, Mi-17, and SA-330 medium helicopters; and AB-212, BK-117. Hughes 300C, Hughes 500D, and Hughes 530F light helicopters.[380]

Iraqi helicopter operations were most effective in the north, where they only faced limited air defenses. Even there, they were most effective against poorly armed Kurdish forces, Kurdish civilians, and Iranian infantry forces, and in exploiting terror tactics like the use of poison gas. Iraq never demonstrated the ability to conduct effective air assault operations or coherent long-range helicopter strikes against Iranian armored and mechanized forces.

Iraq acquired no experience in using its helicopters during the Gulf War, and its land forces showed they were almost totally unprepared for US and French operations using helicopters, particularly the kind of long-range strikes made possible by the AH-64 and long-range air assault operations into Iraqi rear areas. Iraq has conducted some training exercises involving helicopters since the Gulf War, but it is unclear that it has corrected any of these defects, and it is unclear that it will ever solve them in as rigid and stratified a command system until helicopter operations are put under the command of the Iraqi Army, and tactical control is devolved down to the Corps or front level.

Further, Iraq is operating a fleet with some 12 different types of helicopters with very different ages, technologies, and sources of spare parts. The sensor and weapons mix on Iraqi attack helicopters is now nearly 15 years old. Even those helicopters equipped with HOT lack the

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sensors and fire control systems to effectively use the missile without closing to ranges that make the helicopter vulnerable and then remaining in position for longer than is safe.

Taken as a whole, Iraq's land forces can probably still defeat any major Iranian attack and should be able to defeat the Iranian army in detail in the border area if given sufficient warning. Iraq has already shown that it has the military strength to overrun its Kurds in a matter of weeks if UN forces cease to protect them and Iraq's land forces have effectively defeated all organized Shi'ite resistance in the marshes. Contrary to politicized exile reports, it defeated both the Kurdish and Shi'ite uprisings in 1991 very quickly once it organized its forces to do so. It made minimum use of helicopters and never had to rely on them. It can also deploy two to three divisions to Syria and/or Jordan in an Arab-Israeli conflict if it has Syrian or Jordanian host-country support.

Most important, Iraq's land forces can still seize Kuwait in a matter of days and/or occupy much of Saudi Arabia's Eastern Province, *if* they do not face immediate and coordinated opposition from US, Kuwaiti, and Saudi forces. Kuwait is extremely vulnerable. Iraq 23 divisions compared with a total Kuwaiti forces of only about four brigades, only 1 1/4 of which are combat ready. The total forward-deployed US strength in the Gulf is 6,500-21,000 men -- depending on the season of the year. The US only had one brigade prepositioned in Kuwait, however, and most of its personnel in the Gulf are in air force, Marines, and Navy. The US would have to rush in air power and follow-on ground forces to defend Kuwait and much would depend on strategic warning and the speed of US reaction to that warning.

Nevertheless, the Iraqi Army as a whole has severe limitations, and some of its capabilities continue to deteriorate. This deterioration is a product of basic weaknesses in its organization and structure as well as a result of wartime losses, a post-war loss of imports, political turmoil, and the decline of the Iraqi economy. Iraq's growing readiness, sustainability, and deterioration problems have interacted with these inherent weaknesses to degrade Iraq's ability to conduct effective combined arms and mobile warfare.

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The most critical mid-term limitation affecting the warfighting capability of the Iraqi Army is now the impact of the UN arms embargo. Iraq can work around some of its equipment problems, but it needs significant imports of spare parts to maintain its army and bring it back to pre-Gulf War readiness. This also makes it absolutely critical to distinguish between economic sanctions and sanctions on arms. If the UN arms embargo continues to be effective, the Iraqi Army will continue to lose force strength and warfighting quality relative to Iran, the Southern Gulf states, and its other neighbors. It is almost impossible to predict the rate at which the Iraqi army will decline, but it is clear that Iraqi forces have already lost a significant amount of their combat effectiveness and sustainability.

The Iraqi Air Force

In late 2000, the Iraqi Air Force had a total of roughly 35,000 to 40,000 men, including some 15,000-17,000 air defense personnel.[381] Iraq has been able to rebuild many of the shelters and facilities it lost during the war, and much of the Air Force C^4I/BM system. This C^4I/BM system included an extensive net of optical fiber communications net, a TFH 647 radio relay system, a TFH tropospheric communications system, and a large mix of radars supplied by the Soviet Union. Iraq has rebuilt most of the air bases damaged during the Gulf War, and a number of bases received only limited damage. This gives Iraq a network of some 25 major operating bases, many with extensive shelters and hardened facilities.[382]

US experts believe that the Iraqi Air Force still had 330 to 370 combat aircraft in inventory, although many of the Iraqi aircraft counted in this total had limited or no operational combat capability. IISS estimates indicate that Iraq has at least 316 combat aircraft, including six bombers, 130 fighter-ground attack aircraft, and 180 fighters.

The Iraqi Air Force's key operational holdings seem to include a total of 255 fighters and fighter bombers, and some 80 trainers -- some of which are combat capable.[383] Iraq's total holdings seem to include a total of 130 J-6, MiG-23BN, MiG-27, Mirage F-1EQ5, Su-7, Su-20, and Su-25 attack fighters; 180 J-7, MiG-21, MiG-25, Mirage F-1EQ, and MiG-29 air defense

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fighters; MiG-21 and MiG-25 reconnaissance fighters, 15 old Hawker Hunters, a surviving Il-76 Adnan AEW aircraft, 2 Il-76 tankers, and large numbers of transports and helicopters. Estimates of its total surviving inventory by aircraft type vary by source, but Iraq probably retained about 30 Mirage F-1s, 15 MiG-29s, 50-60 MiG-23s, 15 MiG-25s, 150 MiG-21s, 25-30 Su-25s, and 60 Su-17s, Su-20s, and Su-22s.

The IISS estimates that Iraq had six H-6D and Tu-22 bombers; 130 MiG-23BN, Mirage F-1EQ5, Su-7, Su-20, and Su-25 fighter ground-attack aircraft; and 180 F-7, MiG-21, MiG-23, MiG-25, Mirage F-1EQ, and MiG-29 fighters. Iraq was also estimated to have MiG-25 reconnaissance aircraft, two IL-76 tankers, and over 100 trainers, including some Mirage F-1BQs, EMB-312s, and other trainers with combat capability.[384]

Although it is unclear how many air munitions Iraq retained after the Gulf War, some estimates put this figure as low as 50% of the pre-war total. Iraq, however, retains significant numbers of modern air-to-air and air-to-ground munitions. These stocks include AA-6, AA-7, AA-8, AA-10, Matra 530, Matra 550, and Matra Super 530 air-to-air missiles, and AM-39 Exocet, HOT, AS-11, AS-12, AS-6, AS-14, AS-301, AS-37, C-601 Silkworm; air-to-surface missiles; laser-guided bombs, and Cluster bombs.

Iraq has deployed Matra Magic 2 “dogfight” air-to-air missiles on its Mirage F-1s since the war. This is virtually its only major improvement in air force equipment since 1990. It is not clear whether these missiles were delivered before the war, were stolen from Kuwait, or have been smuggled in since. They are an advanced type similar to the more advanced export versions of the US AIM-9, with high energy of maneuver and a maximum range of three nautical miles.[385]

Iraq also retained large numbers of combat-capable trainers, transport aircraft and helicopters, and remotely piloted vehicles. The trainers included some Mirage F-1BQs, 25 PC-7s, 30 PC-9s, 50-60 Tucanos (EMB-312s), 40 L-29s and 40 L-39s. Transport assets included a mix of Soviet An-2, An-12, An-24, An-26, and Il-76 jets and propeller aircraft, and some Il-76s modified to act as tankers. The remotely piloted vehicles (RPVs) included some Iraqi-made

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designs, Italian designs, and Soviet designs. It is unclear how effective Iraq was in using any of these RPV systems, but it did make use of them during the Gulf War.[386]

These assets are numerically impressive. Iraq has not, however, been able to import any new combat aircraft, support and C^4I aircraft, advanced air munitions, surface-to-air missiles, major radars and sensors, or advanced C^4I/BM equipment since the Gulf War. Its basic technology remains frozen at the level it had achieved in 1990. Iraq's efforts to smuggle in air munitions and C^4I/BM equipment has had very limited success. With the exception of some short-range air-to-air missiles, it has not been able to import any of the major new technology it needed in order to react to the lessons of the Gulf War.

The Iraqi Air Force continues to suffer from the damaged inflicted during the Gulf War, and from the impact of more than half a decade of operations without major imports of parts and equipment and foreign technical support. Only about 55% of its fixed wing aircraft are fully serviceable, and helicopter serviceability was poor. While Iraq seemed to have improved its access to smuggled spare parts during some point in 1996-2000, these spares seemed to come largely for its Soviet aircraft, and not for its French-made designs.[387]

Although the Iraqi Air Force has occasionally surged to peaks of over 100 sorties per day since 1996, the creation and expansion of the Coalition "no fly" zones in northern and southern Iraq has severely restricted an already inadequate training program. While senior pilots do fly as many as 90-120 flying hours per year, junior pilots fly as few as 20.

In contrast, US and British aircraft have flown well over 150,000 sorties over Iraq since 1991. While the Iraqi Air Force has been limited largely to standard small fighter formations, pairs of aircraft, or single aircraft, the US routinely flies sophisticated formations involving strike fighters, RC-135 Rivet Joint electronic warfare and sensor aircraft, EA-6B electronic jammers, specially equipped F-16s with high-speed anti-radiation (HARM) missiles, and tankers like the KC-10. The contrast between these US packages of 15-25 aircraft, operating as synergistic high technology formations and the Korean-War vintage Iraq formations is acute. In fact, even the

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Turkish Air Force has flown far more sorties across the Iraqi border to attack hostile Kurdish targets in Northern Iraq since the Gulf War than the Iraqi Air Force has been able to fly over the northern part of its own country.[388]

Iraqi pilots fly less than 60 hours a year versus the 180-250 considered normal in advanced air forces. When they do fly, the Iraqi Air Force exhibits few signs of reacting to the lessons learned during the Gulf War. Further, the participation of some air force officers in coup attempts has led Saddam to carefully monitor and control the resources given to the Iraqi Air Force.[389]

The Iraqi Air Force has limited overhaul and repair capabilities facilities for many of its Soviet-made fighters -- which had previously been overhauled by Soviet technicians or rebuilt in the former Soviet Union. It has significant shortages of spare parts -- particularly for its French-made and newest Russian fighters -- and no access to the Russian and French technical support which it had relied on before the war. The Mirage F-1 is difficult to maintain, and Iraq is likely to have severe problems in keeping its avionics and weapons subsystems fully operational without access to French technical support and new deliveries of parts and equipment.

In short Iraq cannot rebuild its air force to anything approaching its pre-Gulf War strength without massive arms imports and foreign assistance. At some point, Iraq will also need substantial deliveries of more modern French or Russian combat aircraft, and missiles and electronics for beyond-visual-range (BVR) air to air combat and stand-off air-to-ground attacks. It will the airborne sensor, electronic warfare, and C^4I/BM assets to end its dependence on ground controlled intercepts, strike deep behind the forward battle zone, and operate as a coordinated force.

Taken as a whole, the Iraqi air force. It still can probably dominate the skies over the Iran-Iraq border area. It can play a major role in defeating the Kurds, and rapidly defeat the Kuwaiti air force. It probably cannot defeat the Saudi and Turkish air forces in the border areas, but they might need US support to win a quick and decisive victory.

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The Iraqi Air Force has little ability to engage US airpower or a US-led Coalition, but it can conduct limited long-range air attacks against its neighbors, retain some refueling capability, and can use some precision-guided weapons, chemical weapons, and possibly biological weapons. Iraq could use these capabilities to mass a few air raids against selected targets in Iran or across the Gulf, and could use its remaining Exocets to attack tankers and other naval targets in the Gulf.

Like Iran, Iraq is also at least half a decade away from fully rebuilding its air force. Some of its capabilities are frozen in place by its lack of access to new weapons and technology at a time when its Southern Gulf neighbors have relatively free access to the most advanced Western and Russian systems and when Iran has better access than Iraq. Its mission-oriented weaknesses are compounded by a lack of effective central air planning and battle management, a clear concept of how to employ large numbers of aircraft, and a lack of any effective concept for joint operations. The Iraqi Air Force still tends to fight as individual combat elements, and not as a force.

Iraqi Ground-Based Air Defenses

There is no expert consensus on how much of Iraq's land-based air defense assets and air defense system survived the Gulf War, Desert Fox, and the long campaign of attrition that has followed. Many facilities survived the Gulf War because the Coalition concentrated more on the suppression of air defense activity than the physical destruction of land-based facilities and trying to hunt down and kill individual air defense weapons. The US and Britain have launched thousands of strike sorties since that time, however, and have not provided detailed, unclassified estimates of Iraqi losses.

In late 1998, Iraq retained 130-180 SA-2 launchers, 100-125 SA-3 launchers, 100-125 SA-6s, 20-35 SA-8s, 30-45 SA-9s, some SA-13s, and around 30 Roland VI and 5 Crotale surface-to-air missile fire units. Some of these systems were operated by the army. In addition, Iraq had some 2,000 man-portable SA-7s and SA-14s, and some SA-16s.[390] Most of these surface-to-air missile units were operational, and there was evidence that Iraq had improved their readiness and training after 1996.

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Iraq has occasionally redeployed some missiles to create surface-to-air missile "traps" near the "no-fly zones". These traps are designed to attack aircraft with overlapping missile coverage when they attacked launchers deployed near the no-fly zones. While these Iraqi efforts have failed -- and have led to the destruction of a number of the missile launchers involved -- it again is not clear what portion survived or what other detailed redeployments Iraq has made in recent years.[391]

Iraq has made extensive efforts to improve its use of shelters, revetments, dummies, and other passive defenses. It has used such defenses since the beginning of the Iran-Iraq War, and has deployed new decoys after the Gulf War in an effort to reduce its vulnerability. According to most experts, it has repaired many of the bases and air facilities that were destroyed or damaged during the Gulf War. It has 16-20 major air bases, with H-3, H-2, and Al Asad in the West; Mosul, Qayarah, and Kirkuk in the north, Al Jarah, Talil, and Shaybah in the south, and 5-7 more bases within a 150 kilometer radius of Baghdad. Many of these bases have surface-to-air missile defenses.

Iraq has been able to restore much of its battle control and management system, reactivate its damaged airfields, and even build one new military airfield in the south.[392] Many of its sheltered air defense and air force command and control centers remain operational. Iraq's French-supplied KARI air defense communications and data-link system is not particularly effective, but it uses fiber optics and many of the links between its command elements either have survived the bombing or are now repaired.[393]

Many radars and elements of Iraq's air defense C^4I system are also still operable, including such pre-war systems as the Soviet Spoon Rest, Squat Eye, Flat Face, Tall King, Bar lock, Cross Slot, and Thin Skin radars. Iraq also had Soviet, Italian, and French jamming and electronic intelligence equipment. There is no way to know how many of Iraq's underground command and personnel shelters survived the Gulf War, but it seems likely that at least 50- 66% survived the Coalition bombing campaign and that at least 30%-40% have survived the US and British attacks since December 1998.

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Iraq has been reported to be working on its own system and to be attempting to smuggle in radars from Eastern Europe than can detect cruise missiles and stealth aircraft and a "Mother of All Battles (MOAB) system that could provide the KARI system with much better electronic warfare and low altitude coverage for the area around Baghdad and key military facilities. Iraq has also been reported to be working on defenses against anti-radiation missiles and long-range radar guided air defense missiles. Like many of Iraq's efforts, however, it is unclear how real such programs are and whether they will ever have any success. If, as some sources suggest, the system has to rely on modifications of the SA-2 and of the Contraves Skyguard system, there is little chance that it can have great effectiveness. [394]

Iraq has also lost much of the capability it rebuilt between 1991 and December 1998. US and British aircraft hit at many Iraqi major air defense sites during the US-British attacks in Operation Desert Fox in December 1998. Since that time, the US has flown well over 16,000 sorties over the Northern "No Fly Zone", dropping over 1,000 bombs and striking at more than 250 targets.[395] It has flown similar levels of sorties over the Southern "No Fly Zone," and has reported that it has "degraded" Iraq's remaining land-based air defense forces by anywhere from 30%-50% since Desert Fox began in December 1998.

"Degrade" does not always mean destroy, however, and Iraq still retains strong ground-based defenses concentrated around Baghdad, Basra, and Kirkuk. Furthermore, the US and British forces have changed tactics since May 1999, when an F-15 accidentally fired at a shepherd's camp it though was an air defense site. Since that time, the US and British aircraft have tended to fly around key Iraqi air defense units rather than over them, and have largely avoided striking at Iraqi land-based air defenses near populated areas and/or dropping concrete bombs that are more symbolic than destructive against relatively small and well dispersed land-based air defense weapons.

One thing is clear: Iraq faces massive problems in making its land-based air defense forces effective, in modernizing them, and in reacting to the lessons of the Gulf War. Most of Iraq's surface-to-air missile units, radars, automated data processing and transfer system, and central command and communications facilities are now obsolescent to obsolete have only limited to moderate operational capability. Iraq must rehabilitate and improve its radar-guided anti-aircraft

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guns and most of its short-range air defense systems. It must replace its surviving patchwork system of radars and command and control equipment, and in the short-term, it must find a reliable source of parts for its SA-3s and SA-6s.

What Iraq really needs is the ability to buy a truly modern air defense system. Iraq has recognized this requirement as a lesson of the Gulf War, but is confronted with the problem that that the only way it can create an effective system is to buy the Patriot, sold by the US, or the S-300 sold by Russia. The C^4/BM aspects of such a system would also have to be tailored to Iraq's needs, integrate its purchase of the Patriot or S-300 fully into its other air defenses, and provide suitable new sensors and air defense computer technology and software. This would take a major effort in terms of software, radar deployment and technology, as well as adaptation of US or Russian tactics and siting concepts to make such a system fully combat effective.[396]

Iraq's Naval Forces

The Iraqi Navy has never been a major force, and it was virtually destroyed in the Gulf War. Its headquarters remain in Baghdad, and it still seems to have three flotillas that include its large ships, its patrol ships, and mine warfare forces. It also has intelligence, fleet support, land-based anti-ship missile, and training directorates. The Iraqi Navy has naval bases at Basrah, Az Zubayr, and the commercial dock at Umm Qasr. Many of its ships are based as Az Zubayr, although a small channel to Basra along the Shatt al-Arab is used to base some patrol boats.

In late 2000, however, the Iraqi Navy only had a core strength of about 1,900-2,500 men, although some estimates indicate a total manning of 5,000. This manpower strength included the manpower used to guard naval bases and man Iraq's land-based anti-ship missiles. It did not, however, include the naval infantry and marine forces, which are subordinate to the army.

The Navy's surviving forces only included the frigate *Ibn Khaldun*, one Osa-class missile boat, 13 light combat vessels, 5-8 landing craft, the *Agnadeen*, 1 Yugoslav Spasilac-class transport, a floating dry-dock, and possibly one repairable Polnocny-class LST. The IISS and *Jane's* report that Iraq also had three 5,800 ton roll-on roll-off transport ships with helicopter

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decks, a capability to carry 250 troops and 18 tanks, and the ability to embark small landing craft. These ships may be under commercial flags, but they do not have the ability to beach.[397]

This inventory gives Iraq virtually no naval combat capability. The *Agnadeen* and dry-dock are still in Alexandria. The *Ibn Khaldun* is a comparatively large 1,850 ton ship with a maximum speed of 26 knots, but it is designed only for training purposes. Its armament consists of one 57 mm Bofors gun, one 40 mm Bofors anti-aircraft gun, and a four barrel 16/20 mm anti-aircraft gun. The *Ibn Khaldun* can carry a quadruple launcher for Exocet missiles, but this launcher has never been fitted. There are reports that the *Ibn Khaldun* may have been rendered largely inoperable during the fighting in 1991, and even if it was not, it probably has only very limited operational capability because it lacks spares for its Rolls-Royce main engines.

The Iraqi Navy does, however, have some mine warfare capability and at least five batteries of HY-2 “Silkworm” anti-ship missiles. In spite of repeated air attacks, there is no evidence that the Coalition destroyed any of Iraq’s land-based anti-ship missile launchers, missiles, or fire control equipment during the Gulf War.

Iraq conducts virtually no naval training, and rarely has more than one ship on patrol at any given time. Its small bases are vulnerable, and most of its ships, technology, and weapons are at least a decade old. These limitations are so severe that there is no near-term prospect that the Iraqi Navy will acquire more than the most marginal warfighting capability. It can conduct limited raids and fire some anti-ship missiles, but if it attempts to fight Iranian or Western naval and air forces, it is almost certain to be rapidly destroyed.

Iraqi naval forces are so weak that they pose only a limited priority for containment. At the same time, careful attention is needed to two kinds of Iraqi imports: Advanced mine laying capabilities and advanced anti-ship missiles. Any supplier regime should focus on such imports as a significant potential risk to the flow of oil and shipping in the Gulf. There are equally good reasons to deny Iraq submarines and modern surface combat ships. Every effort should be made to prevent Iraq from joining Iran as a regional naval threat.

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Unconventional Warfare and Terrorism

Iraqi security and paramilitary forces, and the terrorist groups Iraq supports, could be a key tool in Iraq's efforts to use force to put pressure on its Gulf neighbors and the West. Iraq has long manipulated extremist groups and movements to serve its ambitions and ideological goals. Like other radical Middle Eastern states, Iraq has found such exploitation to be a cheap and effective substitute for overt political and military action. Such activities allow Iraq to partially decouple its actions from public responsibility, and to suddenly shift support from one group to another, and to disavow a given group at will.

Reporting by the US State Department indicates that Iraq continues to provide haven and training facilities for several terrorist clients. Abu Abbas' Palestine Liberation Front (PLF) maintains its headquarters in Baghdad. The Abu Nidal organization (ANO) has an office in Baghdad. The Arab Liberation Front (ALF), headquartered in Baghdad, continues to receive funding from Saddam's regime. Iraq provides a home for the former head of the now-defunct 15 May organization, Abu Ibrahim, who masterminded several bombings of US aircraft. It allows the Mojahedin-e Khalq (MEK) -- a terrorist group of Iranian exiles opposed to the current Iranian regime-- to maintain a base in Iraq and carry out several violent attacks in Iran from these bases.

The 1999 edition of the US State Department report on Patterns in Global Terrorism describes Iraq's current involvement in terrorism as follows:[398]

> Iraq continued to plan and sponsor international terrorism in 1999. Although Baghdad focused primarily on the antiregime opposition both at home and abroad, it continued to provide safehaven and support to various terrorist groups.
>
> Press reports stated that, according to a defecting Iraqi intelligence agent, the Iraqi intelligence service had planned to bomb the offices of Radio Free Europe in Prague. Radio Free Europe offices include Radio Liberty, which began broadcasting news and information to Iraq in October 1998. The plot was foiled when it became public in early 1999.
>
> The Iraqi opposition publicly stated its fears that the Baghdad regime was planning to assassinate those opposed to Saddam Hussein. A spokesman for the Iraqi National Accord in November said that the movement's security organs had obtained information about a plan to assassinate its secretary general, Dr. Iyad 'Allawi, and a member of the movement's political bureau, as well as another Iraqi opposition leader.

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Iraq continued to provide safehaven to a variety of Palestinian rejectionist groups, including the Abu Nidal organization, the Arab Liberation Front (ALF), and the former head of the now-defunct 15 May Organization, Abu Ibrahim, who masterminded several bombings of U.S. aircraft.

Iraq provided bases, weapons, and protection to the MEK, an Iranian terrorist group that opposes the current Iranian regime. In 1999, MEK cadre based in Iraq assassinated or attempted to assassinate several high-ranking Iranian Government officials, including Brigadier General Ali Sayyad Shirazi, Deputy Chief of Iran's Joint Staff, who was killed in Tehran on 10 April.

Weapons of Mass Destruction

As in the case with Iran, Iraq's efforts to proliferate are so serious that they are discussed separately in a different chapter. There are, however, several key points that must be kept carefully in mind in shaping the broader aspects of policy towards Iraq.

The UN inspection effort is dying, if not dead. On August 5, 1998, Iraq announced that it was suspending cooperation with UNSCOM and its weapons inspectors in Iraq. On October 31, 1998 Iraq went even further, vowing to cease all cooperation with UN arms inspectors and monitors unless the UN embargo were lifted. On December 16, 1998, the United States and Britain launched air strikes against Iraq following a report by Richard Butler, head of the UN Special Commission in Iraq (UNSCOM), stating that Iraq was not cooperating on several fronts.

There has been a low-level air war over Iraq's northern and southern "No Fly" zones ever since. There has been equally little progress in restoring inspections. On December 17, 1999, the Security Council adopted resolution 1284, replacing UNSCOM with the United Nations Monitoring Verification and Inspection Commission, or UNMOVIC). This effort to compromise by replacing UNSCOM with a "kinder and gentler" UNMOVIC has done nothing to persuade Iraq to readmit UN arms inspectors.[399] In fact, UNMOVIC has become "unmoving."

Saddam Hussein has had ample time to quietly develop major covert development program and possibly some production facilites. Furthermore, Iraq has never focused on one type of weapon of mass destruction or one type of delivery system. Iraq has always sought a wide range of biological, chemical, and nuclear weapons and has investigated a wide range of ways of employing them -- ranging from short-range battlefield use to strategic attacks on cities. Iraq has

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never demonstrated that it links its development efforts to some specific employment doctrine, view of escalation, or some concept of deterrence, retaliation, and conflict termination. Instead, Iraq has simply attempted to proliferate in every possible way by all available means.

Iraq is not normally reckless, but it has demonstrated in the past that it is willing to take extreme risks with little warning. Iraq's attack on Iran, its near-genocidal attacks on its Kurds, and its invasion of Kuwait were all high-risk steps taken with little warning by a small decision-making elite, and possibly by one man. All of these decisions seem to have been taken relatively quickly, and to have expanded in scope during the months or weeks between the initial decision to act and actual execution. While Iraq was not indifferent to risk, it often proved willing to escalate in ways that neither its neighbors nor Western experts predicted.

Like other proliferating nations, this does not mean that Iraq cannot be persuaded to sign more arms control agreements, or appear to honor them. Like diplomacy, Iraq is likely to see arms control as an extension of war by other means. It will attempt to use arms control to place limits on its rivals and opponents, while it treats arms control regimes and controls on technology transfer as problems it must solve with lies, concealment, and covert programs. If Iraq's case, and perhaps that of other Middle Eastern proliferators, trust will be impossible and verification will be extremely difficult.

Accordingly, Iraq has good reason to covertly pursue biological weapons as a substitute for nuclear weapons, as well as for their intrinsic warfighting capabilities. Indeed, the more effective outside powers are in denying Iraq nuclear materials, the more Iraq is likely to pursue biological weapons as a substitute -- particularly because any Iraqi leadership will know that Iran is making similar efforts and that no present arms control or export control regime offers any meaningful prospect of denying either Iran or Iraq the ability conduct a silent arms race in this area.

Iraq's leaders also have to be aware that the perceptual balance is of major importance in determining Iraq's ability to use proliferation to achieve political and strategic ends, and that both

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regional and Western political leaders perceive nuclear weapons as the most “lethal” form of weapon and that nuclear weapons confer the most status in terms of how the other nations in the region will view Iraq. As a result, it is neither prudent nor cost-effective for Iraq to make hard choices between its final mix of biological and nuclear weapons, and key delivery systems, until it knows what it can and cannot acquire and the probable lethality of such weapons.

The Continuing Iraqi Military Threat

Iran may be the rising military power in the Northern Gulf, but Iraq’s conventional military forces continue to pose a major threat and have regained a substantial part of their pre-war military capabilities. Iraq can still deploy massive land forces against Kuwait and the Eastern Province of Saudi Arabia, and Iraq’s conventional forces remain the largest in the Gulf in many areas of conventional force strength.

Iraqi military capabilities also take on a special meaning because Saddam Hussein and his coterie have repeatedly demonstrated that they are willing to take political and military risks. Iraq’s near-genocidal attacks on its Kurds, and decision to use chemical weapons against Iran, are examples of its willingness to take such risks and ignore world opinion. Iraq’s attack on Iran, its invasion of Kuwait, and its sudden missile strikes, are secret shifts in policy made by a small decision-making elite, possibly even one man. In each case, the warning indicators were ambiguous and many regional leaders and experts argued that Iraq would take a much more moderate course of action.

It is equally dangerous to try to predict the extent to which Iraq will escalate a crisis once it begins. The scope of Iraqi military action expanded sharply during the course of its war with its Kurds, the Iran-Iraq War, and invasion of Kuwait. Iraq’s leaders have not been indifferent to threats to their own survival, but they have often proven willing to escalate in ways that neither their neighbors nor Western experts predicted.

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Accordingly, Iraq must be regarded as a continuing major military threat to the security of the world's supply of oil exports. There is little hope that Kuwait can be safe as long as any leader like Saddam Hussein is in power, unless the U.S., its Gulf allies, and other Coalition powers maintain a strong deterrent and war-fighting capability to deal with the Iraqi threat. There is a continuing risk of a further conflict between Iraq and Iran, although no one can dismiss the possibility of some alliance of convenience between the two regimes. The Kurds remain a major issue, as does the instability along the Iraqi-Turkish border. Saudi Arabia has a long and vulnerable border with Iraq, and has done far too little since the Gulf War to improve the defense of its oil-rich Eastern province. Iraq remains a potential threat to Israel and Jordan, and the Arab-Israeli peace process.

Iraq will make every effort to conceal its true plans and the full nature of its military efforts, and only Saddam Hussein and a few trusted supporters will have any overview of Iraq's military progress and capabilities. Furthermore, Iraq's plans and polices will remain opportunistic and erratic. Iraq's leaders will be unable to predict the exact areas where they will be successful in evading or vitiating UN sanctions and controls. As a result their strategy, military doctrine, and force development efforts can be expected to evolve on a basis of opportunity. The only thing that seems certain is that Iraq will make a continuing effort to obtain advanced conventional arms and to proliferate in every way that Iraq can conceal.

Implications for US Policy

The US needs to modify, not change, its basic policies towards Iraq. Containment may be frustrating but the US is correct in making this its basic policy towards Iraq. There is no royal road to overthrowing Saddam and converting Iraq into a unified and moderate nation whose leaders focus on the welfare of their people and not on their own ambitions and grandiose military efforts. The US faces many of the same real-world problems it did at the end of the Gulf War. It has no mandate to invade Iraq by force. It has little or no allied support for either such efforts or for US use of Iraq's weak and divided opposition groups as a proxy. It is not ready or capable of

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occupying Iraq and indulging in a massive effort in nation-building and Iraq will not magically reform itself.

This means, however, that the US must continue to maintain a strong military presence around Iraq, to make every possible effort to deny it arms and the ability to proliferate, to try to create suitable counterproliferation capabilities, to continue to work closely with Britain, and to encourage its Gulf allies to do what they can to improve their own defense capabilities. The US must plan to contain Iraq for as long as it takes for some kind of truly moderate regime to both emerge and convincingly prove it can hold on to power. This may easily be a decade or more.

Some aspects of the execution of US policy, however, are faltering and inept. Some as is the case with Iran, are the fault of Congress rather than the Clinton Administration. The Iraq Liberation Act is the key case in point. At the same time, the Administration has been far less in flexible and effective dealing with Iraq than with Iran, and there are many areas where major improvements are needed in US policy.

- *The most important single set of actions the US can take is to fully recognize that it is involved in a worldwide struggle to sustain international support for containment, sanctions on arms, and the control of Iraq's oil revenues.* The Clinton Administration and State Department has conducted only a low-level political struggle to sustain world support for effective containment of Saddam Hussein. It has assumed that repetitive demonization, generalized charges and series of references reference to past UN resolutions, are a substitute for a massive political campaign to win "hearts and minds" and detailed proof of the US case against Saddam's regime.

  The US has made only one coherent effort since the end of the Gulf War to demonstrate that Saddam was responsible for the suffering of the Iraq people, was exaggerating their suffering while ignoring the Shi'ites and Kurds, was systematically allocating funds to his supporters to win political support, and was misusing funds under the oil for food program. This document – "Saddam Hussein's Iraq" -- was issued in September, 1999 –

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nearly a decade into the war of sanctions – and even it is more a glorified press release than an in depth analysis. It should have been issued nine years earlier, justified in detail, and followed up with constant new data and reports.

Senior State Department and Department of Defense officials have made some important speeches on this subject, but they have generally had limited coverage and some have done little more than make unsubstantiated charges. The US government as a whole has failed to convincingly refute a growing flood of UN and "humanitarian" echoes of Iraq's charges about infant death rates, medical problems, death rates, and casualties in any detail. It has not made it clear that nearly 50% of the cut in Iraq's peak per capita income took place during the Iran-Iraq War and before the Gulf War even began. It has not taken UN and "humanitarian" reports to task when they rely blindly on Iraqi data for the situation in 1990 before the Gulf War and ignore Iraq's actions against its Shi'ites and Kurds. The US has not provided coherent, detailed, ongoing reporting on what is actually happening under the oil for food program or refuted charges by UN personnel involved in this program who show a remarkable, if not deliberate, indifference to Iraq's history and the character of its regime.

- *The US needs to begin a major, well funded, and continuing effort to win the battle of perceptions in Iraq, the Gulf, and the Arab World.* This requires far more than statements senior policymakers, and having the State Department put on a web page. It requires a massive, continuing, well-funded, and well-organized public information effort. The US should counter every Iraqi political and propaganda move. It should educate its allies as to the full nature of the Iraqi conventional and WMD threat. It should counter Iraq's exploitation of the hardship issue, and its misuse of UN institutions to get support for its propaganda.

The US should change its approach to sanctions, humanitarian issues, and Iraq's economic and energy development as follows:

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- *The US should active seek major revisions of the present UN sanctions designed to allow oil revenues, foreign investment, and imports to be used to redevelop Iraq and aid the Iraqi people. The US also needs a far more comprehensive and coherent plan to deal with Iraq's humanitarian crisis and future development that does not wait for the fall of Saddam to change the structure of sanctions*. For nearly a decade, the US has failed to deal realistically with the needs of the Iraqi people and give them the proper priority. It has waited on regime changes to solve the problem, and has badly undercut its own moral case through seeming moral indifference. The US needs to take the kind of action necessary make it clear to the world, the Gulf, and the Iraqi people that it respects Iraq as a nation and a people. The US should continue to attack Iraq's regime and Saddam, but should firmly and repeatedly state that it could treat Iraq as an ally under a different regime. It should make it clear that the US recognizes Iraq's importance in the region and legitimate forms of Iraqi nationalism. The US should declare that it understands that Iraq is one of the leading states of the Middle East and the Arab world, and that it feels a new regime in Iraq would allow it to become one of the leading forces for peace and stability in the region.

- *The US should seek to transform sanctions, however, not end them. The US should not give up on those aspects of UN sanctions that control Saddam's access to oil money and arms until it is absolutely forced to. It should use its veto if necessary to block any effort to eliminate such sanctions. It should be prepared to keep UN controls on Iraqi imports and exports in ways that affect Iraq's arms and ability to proliferate as long as Saddam is in power, or as long as the UN can be persuaded to act, even if this means vetoing a lifting of sanctions. What the US should do is take the action necessary to transform sanctions in ways that can allow Iraq to resume economic development and nation building*. This could include the following measures:

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- Allow Iraq and foreign firms to freely invest in economic development and new government and educational facilities of all kinds provided they do not serve military purposes.

- Restoring freedom of movement, and commercial air and naval traffic.

- Allowing approved outside investment under UN supervision.

- Allowing approved foreign aid missions as long as imports are inspected.

- Ways that prevent their use to buy arms and proliferate.

- *As part of transforming sanctions, the US should actively support the rehabilitation and expansion of Iraqi energy production and export facilities as long as this is done under UN supervision, and allow the Iraqi government to carry out oil and gas development projects, and obtain foreign investment and technical support, as long as the imported equipment and export revenues are controlled in ways that prevent their use to buy arms and proliferate.*

The US approach to regime change, overthrowing Saddam Hussein, and dealing with Iraq's opposition groups should change as follows"

- *The US should clearly and publicly define its future goals for dealing with Iraq, and for changing its regime.* None of these policies mean that we should abandon our strategic objectives, our friends, or our principles. The US should state unambiguously and repeatedly that it is only prepared to work closely with a regime that will (a) respect the sovereignty of Kuwait, (b) live in peace with all its neighbors and avoid all acts of terrorism, (c) carry out the terms of the cease-fire in regard to UNSCOM and weapons of mass destruction, and (d) respect the basic human rights of Iraq's citizens.

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The US should continue to reiterate its desire for Iraq to move towards a more representative government that respects the rule of law and the human rights of all citizens. It should express its hope that a new regime will investigate past abuses to determine how to ensure that they will not be repeated. The US might cite the South African approach to such investigations and amnesties as an example that Iraq should consider. At the same time, the US must accept the fact that there is no practical way to hold war crimes trials, or to deal with the complex heritage of human rights violations stemming from the Gulf War, Iran-Iraq War, persecution of the Kurds, and persecution of the Shi'ites.

- *The US should continue efforts to bring down the regime of Saddam Hussein, but should take a different approach and create powerful incentives for efforts to overthrow Saddam from within Iraq. The US should make it unambiguously clear that it does not set impossible standards for a new regime, and create real world incentives to change the Iraqi government and bring down Saddam Hussein.* It must act on the principle that any new leader is better than Saddam, although it should clearly state that certain members of Saddam's coterie like Tariq Aziz and Ramadan are unacceptable, It should state that it understands it cannot dictate who will replace Saddam.

  The US should state that it believes an "amnesty" should be granted to all Iraqis other than Saddam and members of his extended family, who directly participated in crimes against the Kurds, Shi'ites, and Kuwaitis or caused the invasion of Iraq and Iran. There are too many potential rivals near Saddam to rule them out. It should avoid condemning all the members of bodies like the Ba'ath Party, Revolutionary Command Council, or other centers of Iraq's current power elite.

  The US should offer support for the restoration of full sovereignty as an incentive for creating a new regime. It should state that it is prepared to bring an end to the Northern no-fly zone as soon as a new regime emerges in Iraq that makes it clear that it is willing to

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respect the human rights of the Kurds and their right to preserve their own culture. It should state that it is willing to limit the Southern No Fly Zone once a new regime emerges and to end it once a new regime demonstrates its recognition of the border with Kuwait and willingness to live in peace with all of its neighbors.

- *Political incentives, however, are not enough to bring change in Iraq. The US needs to work with its allies to provide a comprehensive mix of economic incentives and disincentives that will inspire Iraqis inside Iraq to act and reassure the rest of the world that the US really does care about the Iraqi people.* The disincentives are easy. Sanctions already provide more than enough "sticks" in place to motivate any opposition within Iraq. What the US needs are "carrots." It needs to create serious economic incentives that can cause a coup from within. Furthermore, we need to move beyond the punitive aspects of the cease-fire and offer a just peace. Iraq's present combination of debt and reparations totals in excess of $150 billion and could cripple Iraq's economic recovery and development for years. Any attempt to enforce such an uncollectable debt could recreate many of the conditions that destroyed Weimar Germany and create a new "peace to end all peace."

- *The US may well be able to offer such economic incentives that are relatively cost free to the US:* One key incentive would be to encourage allied forgiveness of debt and reparations - a burden that falls largely on Kuwait and Saudi Arabia, but which also affects France and Russia. This kind of forgiveness will pay off in regional security and the stability of the world oil market and global economy. In any case, it may be largely a paper transaction Iraq is never going to fully repay all of its debts and reparations.

- *The US should take a different approach to dealing with the external Iraqi opposition and repeal or waive the provisions of the Iraq Liberation Act of 1998.* The Iraqi opposition the US now officially recognizes –the Iraqi National Accord, the Iraqi National Congress, the Islamic Movement of Iraqi Kurdistan, the Kurdistan Democratic Party, the

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Movement for Constitutional Monarchy, the Patriotic Union of Kurdistan, and the Supreme Council for the Islamic Revolution in Iraq -- is often well intended and sometimes courageous. The fact remains, however, that it is now badly divided into weak groups that are further divided on ethnic and religious lines. The opposition groups outside Iraq have several ambitious leaders with military pretensions and claims to be able to unify Iraq's diverse factions.

As for the "military" forces of this opposition, once one cuts through the rhetoric of the Iraqi National Congress and Iraqi National Accord, the only opposition with real military forces is the Supreme Assembly of the Islamic Revolution or SAIRI. This is a religious Shi'ite faction of the Iraqi opposition which has been trained and equipped by Iran since the Iran-Iraq War, and claims to have a brigade with 4,000 men. This force, however, is only a shadow of the force Iran had built-up before 1998. Iraqi forces smashed the SAIRI force in a matter of hours when it attempted defensive combat during the last battles of the Iran-Iraq War. SAIRI has also made it clear that it remains tied to Iran and to its religious heritage and is not prepared to work with the US.

There is little real leadership or unity, and little chance of achieving it. The Kurds may claim some 25,000 men, but are still divided into the Kurdish Democratic Party and the Patriotic Union of Kurdistan. They have only a few small battalions with light armor. By and large, the Kurds do not do particularly well even when they fight fellow Kurds.

The US must also face the reality that most of Iraq's real power elite is drawn from a relatively small group of extended Sunni families from rural areas around Takrit, and that Iraq's military and security forces are carefully structured to maintain Sunni control, and are anything but representative of the deep ethnic and religious divisions in Iraq. The total population is 75%-80% Arab; 15%-20% Kurdish, Turkoman, and Assyrian, and 5% other. It is 97% Muslim, but the ruling Sunni elite is only 32% to 37% of the population, while some 60% to 65% is Shi'ite, and the remaining 3% is Christian or other. Most of the

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population speaks Arabic, but portions speak Kurdish (official in Kurdish regions), Assyrian, and Armenian. Any efforts to replace Saddam comes up against the reality that these ethnic and religious divisions tend to paralyze the outside opposition, while internal power is concentrated in a minority elite.

Changing this situation requires patience, not adventures. It also requires sensitivity to Iraqi nationalism, religious issues, and Arab sensitivities. The US should make it clear that its seeking Saddam's fall by supporting the slow build-up and unification of the Iraqi opposition, rather than by backing one faction at the expense of others or by covert military adventures by the US. The US should actively deal with the opposition and provide overt funding where this is not counter-productive. There is a clear need for overt and covert intelligence collection, a dialogue with opposition movements outside Iraq, and contacts with Iraqis inside Iraq.

- *The Iraq Liberation Act of 1998 is a practical and conceptual failure. It should never have been passed and should be repealed. The US should, however, replace it with an effective covert action program*. There is something farcical about trying to overthrow the regime of a highly nationalistic nation by openly providing one set of its opposition factions with the kind of official support that says "made in America." US should replace the ILA with a major covert action program directed at all opposition groups both inside and outside Iraq. It should provide funds, broadcasting facilities, and other support on a covert basis, but should avoid paramilitary adventurism. It should take every step it can at this late date to avoid making the US appear to be the dominant force behind the Iraqi opposition and brand the elements the US supports as potential traitors. Money and support such reward success, not good intentions and promises. If a strong opposition evolves, and a major target of opportunity arises, it should be supported. If not, supporting forlorn hopes will discredit the US and discourage the rise of more effective opposition. It also risks playing with the lives of those the US supports and creating the equivalent of another Bay of Pigs.

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- *The US has stated in the past that it believes in maintaining the territorial integrity of Iraq. The US should consistently reiterate this statement in its declaratory policy*. It should make it clear that it is concerned with the human rights of the Kurds and Shi'ites and protection of minorities. It should make it equally clear that it will not support any division of Iraq as a state. This is critical to creating effective pressure to change the regime from within Iraq.

- *Once again, the US should make it emphatically clear that it will not take sides between Iran and Iraq, and that it is goal is that they establish peaceful relations and there be no further Iranian-Iraq conflicts.* A US military tilt towards either power is a recipe for disaster.

- *The US must come firmly to grips with the Kurdish issue in ways that help protect the Kurds, but which do not make them the kind of threat to Iraqi unity that will prevent other opposition to Saddam from acting*. The US should declare that it believes that any new regime in Iraq must respect the rights of the Kurds to a separate cultural identity as part of the Iraqi nation, and must respect the rights of all religious sects and minorities to equitable treatment.

  The US should also make it clear, however, that it does not support Kurdish independence or political autonomy beyond the level that Iraqi governments have agreed to in the past. It should not provide support for Kurdish groups of a kind that implies any US commitment to Kurdish independence. It should state that it has no national security interest in Kurdish independence for either Iraq's Kurds or those of Turkey, and should also state that creating a non-viable mini-state will neither aid the Kurds nor bring regional stability.

  The US has abandoned the Kurds in the past, at great cost to Kurdish civilians. Even if they are willing, we cannot take the risk of using them as pawns. The only thing worse than another Bay of Pigs is the prospect of a "Bay of Kurdistan," and Saddam Hussein is

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scarcely likely to be the only Iraqi Arab leader with a long memory and a thirst for revenge.

The US approach to the military aspects of containment and the threat of Iraqi terrorism should change as follows:

- *The US must take the necessary military measures to ensure it can continue to contain and defeat Iraq, and prepare a military contingency capability for any possible collapse of sanctions* As is described in the following chapters, the US is not modernizing and improving its overall power projection capabilities at the level required to support containment. This may or may not require substantial additional expenditure, but one thing its clear, the US must maintain a decisive conventional and technical superiority over Iraq, and pay what it takes to do so.

- *The present "air war" over the "No fly" zones is a wasting asset, and fritters US and British power and credibility away to limited benefit. The US should either actively attempt to deescalate or escalate to levels that strike seriously at leadership and key military targets* Between the end of Desert Fox in January 1999 and September 2000, USCENTCOM reports that aircraft supporting Operation Southern Watch have responded to some 650 Iraqi violations or provocations on 80 different occasions, while aircraft supporting Operation Northern Watch have responded to more than 110 violations or provocations on some 40 occasions. The end result has been over 16,000 sorties over the Northern Fly Zone alone, wihich used over 1,000 weapons to strike at some 250 "targets." At the same time, Ikraq has claimed that over 300 Iraqi civilians have died, and while these claims have been exaggerated, there have been cases – like a strike on May 12, 1999 when a combination of F-15 and F-16 strikes against civilian areas that appeared to have air defenses seem to have killed nearly 20 civilians and wounded over 40 others.[400]

  These efforts have had an increasingly marginal impact. Since May 1999, the sorties over the "no fly zones" have become steadily less effective. The US has gone to extraordinary

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lengths to select targets to minimize collateral damage to civilians. It started using symbolic "weapons" like concrete bombs in populated areas, and then largely abandoned even these exercises in symbolism when it became clear that they might hit politically sensitive targets and air Iraq's hardship and martyrdom campaign.

Of the two options, deescalation seems best. This means flying limited numbers of sorties to demonstrate capability without directly overflying or provoking major Iraqi air defenses– a measure already introduced in a limited form in October 2000. It means not using weapons unless absolutely necessary. This offers the best hope of keeping some kind of US military presence over the "No Fly Zones" while minimizing Iraq's ability to exploit "imperialism" and "hardship" as issues, as well as the risk of any loss of US or British aircraft and crews.

Aggressive "microcontainment" is too politically and financially costly a strategy, and maintaining any kind of activity over the No Fly Zones is a secondary priority. It is far more important to maintain Turkish and Southern Gulf support for forward presence and power projection for contingencies where Iraq takes aggressive action than it is to keep flying by the numbers over the "No Fly Zones."

- *The US needs to work closely with Kuwait and Saudi Arabia to create more effective regional defenses against Iraq. It should consider seeking Egyptian and Jordanian power projection support.* As part of its effort to strengthen containment, the US should make a major new effort to prepare Saudi Arabia and Kuwait to defend against Iraq, and to develop an integrated Saudi-Kuwaiti-US-British approach to joint defense. This is an essential step both to deal with the current weaknesses in Saudi and Kuwaiti forces, and to prepare for any easing or break down of military sanctions. It may also now be worth revisiting the idea of Egypt providing major contingency forces and possibly Jordan.

- *The US should carefully monitor Iran's actions, and support of terrorism, and attempts to use asymmetric warfare and be prepared to retaliate in force.* As Iraq opens up, it will

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inevitable find it easier to carry out acts of terrorism and covert operations – as well as support terrorist and extremist groups. Iraq may well prove to be a significant danger and the US and its Southern Gulf allies should prepare for this threat.

Finally, the US should change its policy towards countering Iraqi proliferation as follows:

- *The US should continue in its efforts to block the transfer of dual-use, missile, fissile material and high technology weapons to Iraq.* The US has already given high priority to trying to restart the UN inspection effort and create an effective UNMOVIC to replace UNSCOM. It needs to recognize that the chances of inspection are now very limited indeed. It needs to shift its focus to provide all of the intelligence and diplomatic effort necessary to block Russian, Chinese, European, and other transfers of weapons, dual-use technology, fissile material, and high technology weapons to Iraq – just as it should to Iran. Once again, the US should continue with efforts like Nunn-Lugar and trade incentives. The US should make it clear that it is one thing to ease economic sanctions and quite another to remove the threat of arms sanctions. Any nation which acts as an aggressive and destabilizing supplier of advanced arms and military technology to Iran should face massive trade and investment penalties.

- *The US should find new ways to internationalize its anti-proliferation efforts, and provide a far more aggressive and detailed campaign to win international support.* The US should make a broad declaratory statement indicating that it is seeking an end to proliferation throughout the region, that it believes in the continuing enforcement of all relevant arms control treaties, and that the tightest possible controls must be maintained on dual-use exports to all countries in the region. It should be made clear to the region, and the world, that the US is not singling out Iraq alone and that it has a clear global and regional strategy. At the same time, it should make a comprehensive and detailed effort to

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educate the region and the world into the details of Iraq's actions and efforts, just as it should for Iran.

- *The US needs to restructure its approach to fighting Iraqi proliferation.* To add a strong off-sensive deterrent threat. The US should make it clear that it will never tolerate the use of weapons of mass destruction, and will respond with force. It should declare that it will seek to prevent all transfers of advanced conventional arms and dual-use technology to both Iran and Iraq and other proliferators in the region until they have proven their peaceful intentions and are fully integrated into a regional security structure. (Which might be a long, long time.)

- *The US must develop better counterproliferation capabilities to replace the lack of an effective UNSCOM, UNMOVIC, and an IAEA inspection regime.* Whatever happens to UNMOVIC, the US faces an evolving threat that is a clear reason to strengthen the funding of US counterproliferation programs, including theater missile defense, as has been suggested earlier. At the same time, the US must make it clear that it will work with Britain and other allies to replace UNSCOM and the IAEA in providing a constant stream of warnings about Iraq's efforts to proliferate. It must provide regular white papers and unclassified intelligence that makes it clear that Saddam has not given up on proliferation and that explains what the threat really is. We also should make it clear that US support for any new regime will be heavily dependent on the degree to which it does or does not proliferate.

There are two broader aspects of US policy towards Iraq will illustrate broad problems that the US needs to change not only in dealing with Iraq, but with other countries in the world. First, too much of US diplomacy in dealing with Iraq has been filled with vacuous moral posturing that has not been supported by American action and decisiveness, or supported with detailed evidence that can convince the world the US is right. Loudly stating moral principles, and insisting that the US knows what is right, is not effective policy. It at best is posturing for the media and

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political constituencies that deal in ideology rather than reality. “Demonizing” Saddam Hussein while only making a faltering and incompetent effort to demonstrate his real failings, is not effective diplomacy. Neither is insisting he is weak because the US thinks he should be weak, sanctioning the Iraqi people while claiming to sanction its leaders, giving opposition groups a puffed-up status they do not deserve, talking grandly about principle while not creating a tangible plan of action, and making sweeping statements about policy without a detailed tactical plan and end game are all part of this tendency to declare moral victory without winning a real one. The US needs to give far fewer moral lectures, conduct truly professional diplomacy, and let its actions speak louder than its words when action is really required.

Second, the use of military force is neither a game played with toys or an exercise in gradual, carefully escalated surgery. If force is used at all – and it is best used very rarely indeed it must be used with enough shock and ruthlessness to achieve its objectives. Furthermore, these objectives must be clearly designed and achievable, not based on the kind of moral posturing just described. Since the Gulf war, the US has tended to play at military tokenism. Desert Fox is the only example of US use of force against Iraq after the Gulf that started at a sufficient level to convey a decisive message. Its execution came after so many false starts and petty strikes, and was ultimately so limited in the scope of its targeting, that it ended with a whimper rather than a bang. While the concept of gradual, carefully tailored escalation may be intellectually desirable, it is almost always a failure when the stakes really count. Similarly, obsessive concern for media sensitivities, collateral damage, and casualties contributes to failure, almost always and raises the ultimate cost in human suffering. Once again, American policy should be based on the principle that force will be used at level, and in the way, necessary to meet its objective or should not be used at all.

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VII. Military Security, and Gulf Stability

Throughout this analysis it has been clear that the game of nations that shapes the struggle for power in the Gulf is shaped largely by the threats posed by Iranian and Iraqi strategic ambitions, Saudi Arabia's need for status and security, and by the desire of the smaller Southern Gulf states to find some way to create the balance between the larger powers in the Gulf that provides the most security, status, and freedom of action. Military power is an important element in this game, but only one element among many. Further, most of the Gulf's leaders tend to think of military power more in terms of political prestige and leverage, than in terms of conflicts and war fighting capabilities. Many also see their own military forces as a potential rival for power and as a threat which political control is more important than effectiveness.

At present, it is the added weight of US military capabilities, rather than the balance of regional forces that shapes the outcome of most contingencies. The US now maintains a significant forward presence in the region, to deter--"and if need be, defeat"—Iranian and Iraqi aggression. In 2000, it deployed an average of 30 naval vessels, 175 military aircraft, and between 17,000-25,000 soldiers, sailors, airmen, and Marines in the CENTCOM area of operations.[401]

Gulf leaders and military planners react to the role the US will play or not play in any given conflict. They react to the fact the US has emerged from the Cold War and the Gulf War with a major advantage in conventional forces, military technology, power projection capability and nuclear forces. The Gulf states do not think in terms of US military capabilities as an outside power or a wild card. They think of the US as the fourth player in a regional balance of power that is shaped largely by the evolving military capabilities of Iran, Iraq, Saudi Arabia, and the US. Other smaller Gulf powers, peripheral states, and the major external powers like China, Britain, France, and Russia can play a role, but not a major one.

Gulf nations also shape their forces in reaction to US conventional military superiority. They study the advances in US tactics, technology, training, battle management systems, and methods of war fighting, and shape many of their reaction to these developments is a key factor in

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each nation's arms purchases accordingly. US conventional superiority is a key factor shaping Iranian and Iraqi efforts to proliferate, to improve their capabilities to use asymmetric warfare, and to substitute intimidation and "political wars" for the use of actual military force in ways that might provoke a major US military intervention. For every reaction, there is an equal and opposite reaction.

The Evolving Military Balance in the Gulf

The current balance of forces in the Gulf is summarized in Table One. It is important to understand that forces in this table are the product of a military build-up that is now well over a quarter of a century old. While these forces include a great deal of modern military technology, they are the products of an arms race that began long before the "revolution in military affairs" and which has been driven by many other factors. Military forces in the Gulf have been shaped by the Cold War, Nasserism, the fall of the Hashemite dynasty in Iraq, the Arab-Israeli War, British withdrawal from the Gulf, the Iran-Iraq War, the Gulf War, and a host of minor regional quarrels.

Fortunately for the US and its Southern Gulf allies, this "revolution of military affairs" has presented major problems for Iran and Iraq. Both have faced major problems in modernizing their forces during the period in which terms like the "revolution in military affairs" have been in vogue. Iran has not had access to Western arms since 1979, and has never had free access to advanced Soviet/Russian arms. It lost 50-60% of its land order of battle in the climatic battles of the Iran-Iraq War in 1988, and it has never had the funds or access to arms imports since that time to carry out a broad military build-up or modernize most of its forces.

Iraq lost much of its total strength in the Gulf War, and has had no meaningful access to arms imports since August 1990 – nearly a decade ago. Its forces have had to concentrate on internal security, Shi'ite resistance, and the Kurdish security zone. Rather than preparing for war, Iraq's forces have been constrained by "no fly" and de facto "no drive" and no exercise zones. They have also been subject to a series of further attacks – most notably in Desert Fox and its aftermath. Neither Iran nor Iraq has had the ability to directly challenge the US edge in

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conventional capabilities and have been virtually force to see proliferation and asymmetric warfare as their only counters to US superiority in conventional military technology and tactics.

In contrast, the Southern Gulf has been able to make continuing arms purchases that have ensured a steady flow of new arms and technology diffusion. Nevertheless, the Southern Gulf states have made only limited progress in transforming their arms buys into effective deterrent and defense capabilities. They have often bought the most modern combat aircraft, armor, and ships available for their prestige and "glitter factor," but they have usually failed to provide readiness, sustainability, training, and effective battle management. They have favored national efforts and petty local rivalries over regional cooperation. The end result has been to institutionalize their military dependence on the US, leaving them vulnerable if the US and the West cut back their presence and power projection capabilities.

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Table VII-1

Gulf Military Forces in 2000 – Part One

	Iran		Iraq	Bahrain		Kuwait	Oman	Qatar	Saudi Arabia*	UAE	Yemen
Manpower											
Total Active	513,000	429,000	11,000	15,300	43,500	12,330	201,630	64,500	66,300		
Regular	388,000	429,000	11,000	15,300	37,000	12,330	126,500	64,500	66,300		
National Guard & Other	125,000	0	0	0	6,500	0	75,000	0	0		
Reserve	350,000	650,000	0	23,700	0	0	25,000	0	40,000		
Paramilitary	40,000	50,000	10,150	5,000	4,400	0	15,500	1,100	70,000		
Army and Guard											
Manpower	450,000	375,000	8,500	11,000	31,500	8,500	150,000	59,000	61,000		
Regular Army Manpower	350,000	375,000	8,500	11,000	25,000	8,500	75,000	59,000	61,000		
Reserve	350,000	650,000	0	0	0	0	25,000	0	40,000		
Active Main Battle Tanks	1,135	1,900	106	293	117	44	710	250	900		
Total Main Battle Tanks***	1,345	2,200	106	385	117	44	1,055	331	990		
Active AIFV/Recce, Lt. Tanks	555	2,000	71	355	78	112	2,387	578(20)	400		
Active APCs	590	2,100	340	100	170	172	2,630	620	380		
Total APCs	590	2,400	340	140	183	172	3,440	620	440		
ATGM Launchers	420+	480+	15	118	68	100	480+	305	71		
Self Propelled Artillery	290	150	62	41 (59)	24	28	200	177	30		
Towed Artillery	1,950	1,900	36	0	91	12	318(58)	93	412		
MRLs	700	500	9	27	0	4	60	64 (24)	220		
Mortars	6,500	2,000+	30	50+	89	39	650+	135	600		
SSM Launchers	46	36?	0	0	0	0	10	6	30		
Light SAM Launchers	700	1,100	58	0	62	0	650	100	300		
AA Guns	1,700	5,500	27	0	28	0	10	62	470		

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Table VII-1

Gulf Military Forces in 2000 – Part Two

	Iran	Iraq	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia*	UAE	Yemen
Air Force Manpower	25,000	35,000	1,500	2,500	4,100	2,100	20,000	4,000	3,500	
Air Defense Manpower	25,000	17,000	0	0	0	0	16,000	0	0	
Total Combat Aircraft	291	353	34	76	40	18	417	101	89(40)	
Bombers	0	6?	0	0	0	0	0	0	0	
Fighter/Attack	157	130	12	40	12	18	153	43	27	
Fighter/Interceptor	93	180	22	8	0	0	190	28	16	
Recce/FGA Recce	15	8	0	0	12	0	10	8	0	
AEW C^4I/BM	0	0	0	0	0	0	5	0		
MR/MPA**	0	0	0	0	0	0	0	0	0	
OCU/COIN/CCT	0	18	0	28	16	0	14	26	0	
Other Combat Trainers	35	155	0	0	0	0	50	0	6	
Transport Aircraft****	69	34	3	4	21	6	62	22	16	
Tanker Aircraft	4	2	0	0	0	0	16	0	0	
Total Helicopters	681	500	47	28	36	24	130	91	25	
Armed Helicopters****	100	120	40	20	0	12	12	49	8	
Other Helicopters****	581	380	7	8	36	6	118	42	17	
Major SAM Launchers	155	340	8	24	0	0	128	36	57	
Light SAM Launchers	65	200	7	60	28	9	181	124	120	
AA Guns	-	6,000	-	60	-	-	420(150)	-	-	

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Table VII-1

Gulf Military Forces in 2000 - Part Three

	Iran	Iraq	Bahrain		Kuwait	Oman	Qatar	Saudi Arabia*	UAE	Yemen
Total Naval Manpower	40,600*	2,000	1,000	1,800	4,200	1,730	15,500	2,000	1,800	
Regular Navy	18,000	2,000	1,000	1,800	4,200	1,730	12,500	2,000	1,800	
Naval Guards	20,000	0	0	0	0	0	0	0	0	
Marines	2,600	-	-	-	-	-	3,000	-	-	
Major Surface Combatants										
Missile	3	0	3	0	2	0	8	4	0	
Other	2	1-2	0	0	0	0	0	0	0	
Patrol Craft										
Missile	20	1	4	8	4	7	9	8	4	
(Revolutionary Guards)	5	-	-	-	-	-	-	-	-	
Other	41	5	4	2	7	0	17	6	8	
Revolutionary Guards (Boats)	40	-	-	-	-	-	-	-	-	
Submarines	3	0	0	0	0	0	0	0	0	
Mine Vessels	7	4	0	0	0	0	7	0	6	
Amphibious Ships	9	0	0	0	1	0	0	0	1	
Landing Craft	17	-	4	2	4	1	8	5	2	
Support Ships	30	3	5	4	4	-	7	2	2	
Naval Air	2,000	-	-	-	-	-	-	-	-	
Naval Aircraft										
Fixed Wing Combat	0	0	0	0	0	0	0	0	0	
MR/MPA	10	0	0	0	(7)	0	0	0	0	
Armed Helicopters	0	(6)	0	0	0	0	21	(8)	0	
ASW Helicopters	20	0	0	0	0	0	0			
SAR Helicopters	0	0	0	0	0	0	4	(6)	0	
Mine Warfare Helicopters	9	0	0	0	0	0	0	0	0	
Other Helicopters	20?	-	2	-	-	-	6	-	-	

Note: Equipment in storage shown in the higher figure in parenthesis or in range. Air Force totals include all helicopters, including army operated weapons, and all heavy surface-to-air missile launchers.

* Iranian total includes roughly 100,000 Revolutionary Guard actives in land forces and 20,000 in naval forces.

** Saudi Totals for reserve include National Guard Tribal Levies. The total for land forces includes active National Guard equipment. These additions total 450 AIFVs, 730(1,540) APCs, and 70 towed artillery weapons.

*** Total tanks include tanks in storage or conversion.

**** Includes air force, army, national guard, and royal flights, but not paramilitary.

***** Includes in Air Defense Command

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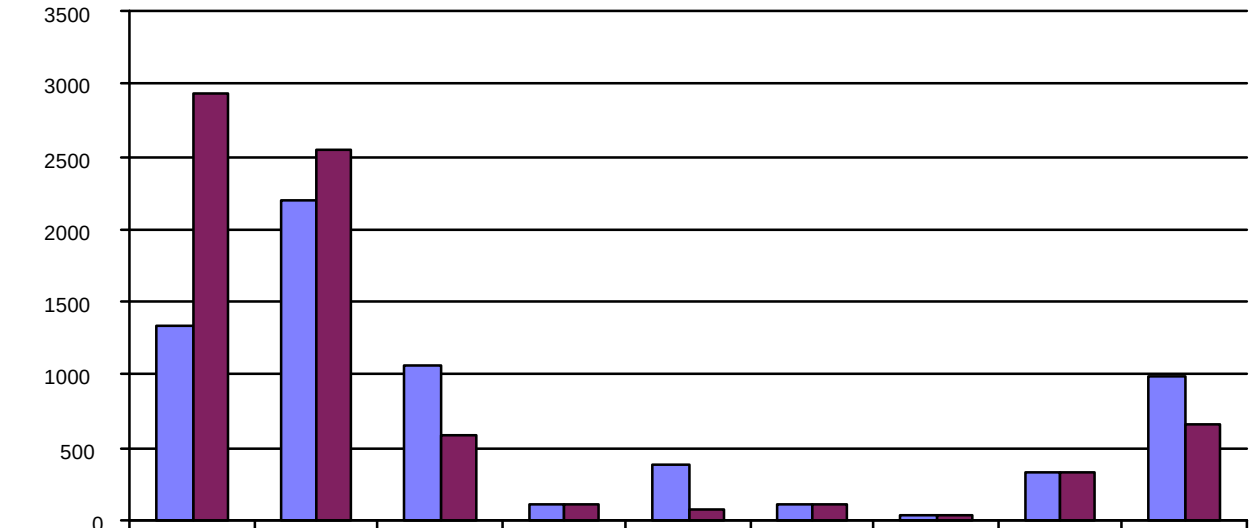
Source: Adapted by Anthony H. Cordesman from interviews, International Institute for Strategic Studies, Military Balance (IISS, London); Jane's Sentinel, Military Technology, World Defense Almanac; and Jaffee Center for Strategic Studies, The Military Balance in the Middle East (JCSS, Tel Aviv)

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Figure VII-1

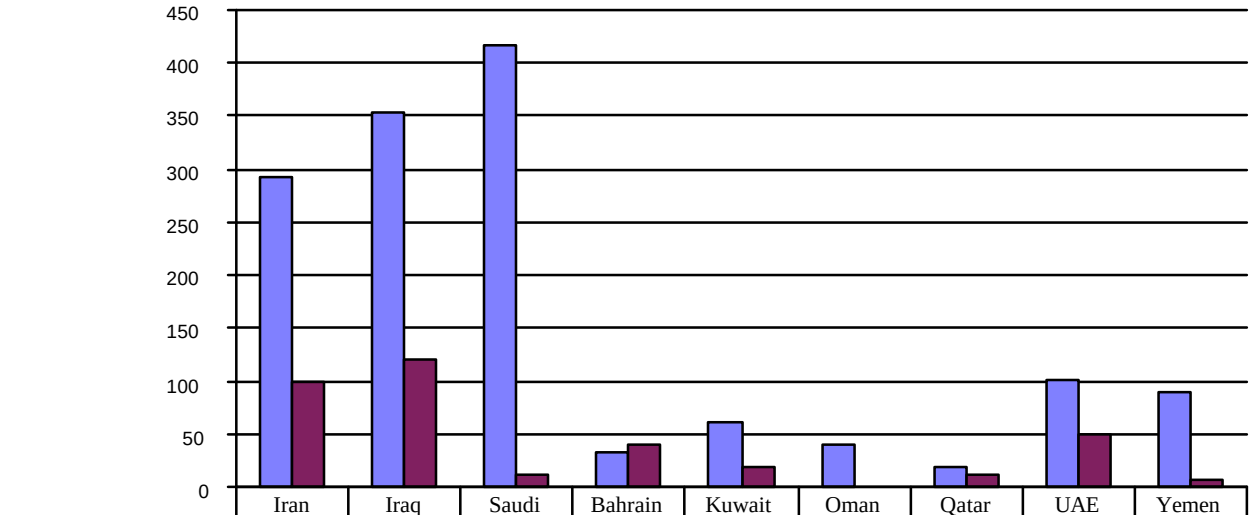
Major Measures of Gulf Combat Equipment Strength - 2000

Total Main Battle Tanks and SP/Towed/MRL Artillery in Inventory



	Iran	Iraq	Saudi	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
Tanks	1345	2200	1055	106	385	117	44	331	990
Artillery	2940	2550	578	107	68	115	44	334	662

Total Fixed Wing Combat Aircraft and Armed Helicopters



	Iran	Iraq	Saudi	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
Fixed Wing Combat	291	353	417	32	62	40	18	101	89
Armed Helicopters	100	120	12	40	20	0	12	49	8

Source: Adapted by Anthony H. Cordesman from various sources and the IISS, Military Balance.

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The Iranian and Iraqi Challenge

The previous chapters have shown that both Iran and Iraq are well aware of the steady improvement in US conventional war fighting capability and have learned the hard wa developed a keen appreciation of Western military technology. Iran experienced military defeat by the US in the "tanker war" of 1987-1988, and Iraq experienced defeat in the Gulf War and in a long series of encounters like "Desert Fox" that go on to this day. At the same time, both Iran and Iraq have sought to break out of military containment, counter the US military advantage, increase their power and strength in the region, and obtain some degree of hegemony in the Gulf region.

While senior Iranian and Iraqi officials and officers rarely refer specifically to the weapons, technologies, and tactics that make up "revolution in military affairs," they are clearly aware that there are still a limited number of ways in which they can attempt to defeat the US advantage in conventional forces, military technology, power projection capability and nuclear forces:

- *Conventional build-up:* They can attempt to compete directly with the US by building up the quality and quantity of their conventional forces to the point where they can deter or defeat US action, or raise the cost of US action to an unacceptably high level.

- *Proliferation:* They can seek to acquire weapons of mass destruction as a deterrent to US military action, to create a capability to destroy critical regional and allied capabilities before the US can react, and to threaten US forces, allied territory, and even US territory with covert or proxy attacks.

- *Asymmetric warfare:* They can attempt to exploit methods of warfare where the US does not have a clear advantage. These include terrorism and the use of proxies; covert attacks; low intensity and highly political conflicts where the US lacks the political justification to escalate; armed support of opposition, ethnic, and insurgent movements in other countries; the use of civilians and civilian facilities as shelters and sanctuaries; and forms of warfighting like mine warfare and threats to the shipping channels in the Gulf where the US faces major problems in dealing with the kind of conflict involved. They also include terrorist attacks on US forces, allies, and territory.

- *Diplomatic "warfare:"* They can seek to use diplomatic means to limit US military action, force reductions in the US presence in the region, and force or persuade the allies and potential coalition partners of the US to limit their ties to the US. This "warfare" includes efforts to manipulate the Southern Gulf states, key peripheral states like Turkey, and outside powers like China and Russia, and the United Nations.

- *Confrontations and Wars of attrition and endurance*: They can attempt to engage the US in prolonged confrontations, low-level conflicts, and episodic crises where the US cannot take active advantage of

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its military superiority or escalate, and is trapped into a indefinite, costly, and frustrating process of containment that it cannot terminate or "win."

- *Adaptations of technology to areas of US vulnerability:* So far this threat seems to consist largely of information warfare and areas like cyberterrorism.

Iranian and Iraqi leaders seem to understand that they have no current capability to compete with the US in a direct conventional military build-up or even to obtain enough advanced military equipment to equip any given mission or military service. During the last decade, Iran and Iraq have faced continuing problems because of their losses in past defeats, sanctions and containment, and limited resources. As a result, the recent history of the Gulf is to some extent the history of Iranian and Iraqi efforts to exploit the other five ways of countering US conventional superiority.

Iraq has faced the most severe problems. When Iraq invaded Kuwait in August 1990, it was the dominant regional military power in the Gulf. It had decisively defeated Iran during the spring and summer of 1988, in battles that cost Iran some 40-60% of its inventory of major land force weapons. Furthermore, the US and Britain had inflicted major losses on the Iranian Navy in the "tanker war" of 1987-1988, leaving it with little ability to challenge Iraq. Iraq had the only modern, combat effective armored and mechanized forces in the Gulf and an air force that was emerging as combat effective for the first time. It had massive missile forces and chemical warfare capabilities, was beginning to deploy large numbers of biological weapons, and was making substantial progress in developing a nuclear capability.

Iraq has managed to rebuild and reorganize its forces that survived the Gulf War, but it now has only about half the land and air capability it had when the air campaign began. It has not had any significant imports of arms or military technology since the summer of 1990, and Iraq’s efforts to acquire new military technology and develop its military industries have been severely limited by the impact of nine years of UN sanctions. As a result, it has had no practical opportunity to react to many of the lessons of the Gulf War.

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At the same time, Iraq has faced severe problems in trying to counter US conventional military superiority by improving its capabilities for proliferation and asymmetric warfare. Most of Iraq's missile, chemical, biological, and nuclear capabilities were either destroyed during the Gulf War or dismantled by UNSCOM and the IAEA, and there have been no visible signs of major new efforts to proliferate since UNSCOM and the IAEA left in December 1998. Iraq has not succeeded in developing a major capability to use unconventional warfare to threaten its neighbors, in exploiting the internal problems and divisions in neighboring states, or finding movements or "proxies" it can use as a substitute for conventional military power.

Iraq's regime, however, has not changed in character or given up its efforts to challenge the US. While it generally claims to be a defensive power and rarely discusses its intentions or offensive action except in the context of broad political threats, it is likely to be a revanchist state as long as Saddam Hussein is in power. It has managed to force an end to UNSCOM and IAEA inspection. It is seeking to break out of sanctions, and will almost certainly seek to rebuild its conventional military power as soon as it can do so. It also retains enough conventional strength to remain a significant threat to all its neighbors

Iran, in contrast, has partially recovered from its defeat in the Iran-Iraq War, and is again a major military power by Gulf standards. However, Iran is scarcely a modern military power by the standards of the US. Many of Iran's post-Gulf War arms imports have done little more than offset the steadily greater obsolescence of its Western-supplied equipment, and it has had only limited imports of modern aircraft and armor.

Iran has reacted by developing military capabilities that are carefully focused on the potential weaknesses in US capabilities. The massive infantry-artillery dominated forces of the Iran-Iraq War are being replaced by forces shaped for specific missions. It has developed a substantial capability to threaten shipping through the Straits of Hormuz and the rest of the Gulf, and has developed a substantial capability for unconventional warfare that it can project into the

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Gulf and throughout the region. It has steadily increased its missile, chemical, biological warfare capabilities, and is seeking nuclear weapons.

Unlike Iraq, however, Iran is in the middle of considerable political change. The election of President Khatami in May 1997, has revealed a major split between Iran's "moderates," "traditionalists," and extremists. Iran has given its economy a higher priority than arms and has steadily improved its relations with its Southern Gulf neighbors. There is at least some prospect that the US and Iran can reestablish diplomatic relations over the next few years, although no one can predict the future course of the Iranian revolution and how "moderate" Iran will really become.

The Role of Saudi Arabia and the Southern Gulf States

For all the rhetoric surrounding the Gulf Cooperation Council, the Southern Gulf states remain as divided as they were at the start of the Gulf War. Their arms purchases reflect the same lack of effective standardization, interoperability, and focus on key missions as was the case before the Gulf War. Some Southern Gulf countries have made significant improvements in individual aspects of their military capabilities. The Saudi Air Force is a case in point. No Southern Gulf state, however, can boast of a cohesive effort to modernize all of its forces, or a coherent effort to advantage of the "revolution in military affairs." Southern Gulf military officers are certainly aware of US doctrine and technology, and US discussions of the "revolution in military affairs. Nevertheless, Southern Gulf military planning remains dominated by politics and petty rivalry, and far too many arms purchases focus on new technology and the "glitter factor," rather than effective war fighting capability.

Far too little real progress has been made per dollar in the effective defense of Kuwait and the Saudi border with Iraq, particularly in creating effective capabilities for armored and joint warfare. The Southern Gulf states have made only limited progress in dealing with mine warfare, other Iranian naval threats in the lower Gulf, and the asymmetric threats posed by Iran's Revolutionary Guards. Far too little emphasis has been placed on training, sustainability,

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interoperability, and effective battle management. As a result, many of the arms purchases made since the Gulf War have done little to improve military effectiveness.

The Southern Gulf states have also tended to exploit their strategic dependence on the US. The security the US has provided them through its conventional superiority and "revolution in military affairs" has allowed the Gulf states to pursue their own separate interests without creating either effective national forces or cooperative security efforts.

Developments in Iran: Focus Poverty, Asymmetric Warfare, and Proliferation

Iran is the most critical near-term threat to the US, although it has never clearly defined its intentions regarding the use of military force against either US forces in the Gulf or its regional neighbors. It is easy to talk about Iran as a nation that is seeking to be a hegemon or trying to dominate the Gulf, but Iranian official statements are almost exclusively defensive and talk about external threats to Iran. Iran has a regime that is hostile to the West and its neighbors in many ways, but this hostility does not translate into a predictable willingness to start a conflict or openly challenge the US and its allies in a conflict. Iran's revolutionary rhetoric is mixed with statements describing its good intentions, and threats are mixed with defensiveness. Iran faces powerful limits to its ability to import arms, develop its weapons of mass destruction, and create effective military forces. It has to deal with the fact that every hostile or threatening act it takes is likely to provoke a reaction from the US, Southern Gulf states, and Iraq.

At the same time, many of the actions Iran has taken do improve its capabilities to challenge US power and give it some ability to exploit the "revolution in military affairs:"

- Iran has sought to modernize its conventional forces – although it has faced major problems because of its financial situation, the reluctance of Western states to sell it arms and technology, and US pressure to limit Russian and Chinese sales.

- Iran has built up a significant capability to challenge the flow of shipping through the Gulf and the Strait of Hormuz that is highly dispersed, which can conduct covert and low level attacks which the US may find difficult to respond to for military reasons, and which can put pressure on the Southern Gulf states in "wars of intimidation" without actually leading to conflict.

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- Iran has become a serious proliferator, although it has again faced serious problems in terms of acquiring the technology and weapons it needs.

- Iran and Syria fought a long proxy war against Israel in Lebanon, and Iran continues to support extremist and terrorist groups in Gaza and the West Bank. While this does not directly challenge the US, it effectively acts as a "war of attrition" that puts indirect pressure on the US by threatening a key ally and the Arab-Israeli peace process.

- Iran has attempted to counter US military strength by political attacks on US imperialism, ties to Israel, and secularism. At the same time, Iran has made major efforts since the election of President Khatami to improve its relations with the Southern Gulf states. It has called for a new Gulf security structure that includes Iran and excludes the US, and has attempted to reduce Southern Gulf ties to the US.

The Impact of Limited Iranian Arms Transfers

Iran is clearly aware of the threat posed by US technology and war fighting methods, and of the need to modernize its forces. While it has never published detailed force plans, there have been many reports of Iranian interest in major force modernization plans and in the advanced weapons and technologies that support the "revolution in military affairs". At various times, Iran has sought to procure a wide variety of advanced weapons, and been able to take advantage of some aspects of technology diffusion. On the other hand, Iran's revolutionary economy has remained weak, and Iran's mismanagement of its budget, development, and foreign debt has reduced Iran's access to military technology and arms. "Sanctions" on arms purchases in the form of diplomacy and supplier regimes have been far for effective than economic sanctions. The US and its allies have blocked many transfers of advanced arms to Iran, particularly from Europe and the FSU.

The end result has been a decade-long period in which Iran has had comparatively few transfers of arms and technology. According to declassified US intelligence estimates, Iran signed new agreements worth $10.2 billion during the four-year period between 1987-1990 -- the time between the final years of the Iran-Iraq War and the Gulf War. Despite some reports of massive Iranian military build-ups, Iran's new arms agreements dropped sharply during the four-year period following the Gulf War, and totaled only $4.8 billion during 1991-1994.

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Iran signed only $2.2 billion worth of new arms agreements during 1992 and 1999 -- a period heavily influenced by an economic crisis inside Iran, low oil revenues, and problems in repaying foreign debt. Iran ordered $400 million in arms from Russia, $1000 million from China, $500 million with other European states (mostly Eastern Europe), and $300 million from other countries (mostly North Korea). The drop in agreements with Russia reflected both Iran's financial problems and the result of US pressure that had led President Yeltsin not to make major new arms sales to Iran. Iran's new agreements with China and North Korea heavily emphasized missiles and missile production technology. Similar trends took place in deliveries. Iran took delivery on 3 billion dollars in arms in 1992-1995 and 1.7 billion dollars in arms in 1996-1999.

Focused Poverty and Asymmetric Threats

Iran's has attempted to deal with these problems by focusing on acquiring weapons of mass destruction, enough advanced armored and air weapons to give its some defensive or deterrent capability, and on making larger purchases of systems that can threaten tanker traffic and the Southern Gulf. Iran has bought enough arms to rebuild its army to the point where it can defend effectively against a weakened Iraq. It has begun to rebuild its air force and land-based air defenses, and can put up a far more effective defense than in 1988.

It has restructured its regular forces and the Iranian Revolutionary Guards Corps to improve the defense of its Southern Gulf coast and develop a far more effective ability to attack naval forces, tanker traffic, offshore facilities, and targets along the Southern Gulf coast. It is this "focused poverty" that makes Iran potentially dangerous in spite of its relatively low level of arms imports and the obsolescence or low quality of much of its order of battle.

Recent Iranian Purchases and Purchasing Efforts

Iran's key purchases and procurement efforts reflect many of the priorities it needs to offset the US, British, and Southern Gulf edge in modern weapons. Reports of such efforts include the following developments:[402]

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LAND

- Russian, and Polish T-72 Exports. Some reports indicate Iran has procured as many as 380 T-72Ss from Russia, and 100 T-72M1s from Poland since 1990. This would give it an inventory of about 480 T-72s. The IISS, however, reports only 120 T-72s and 75 T-62s on hand in 2000, plus a possible additional 100 T-72 kits ordered in 1989 and delivered in 1998.
- Claims to be producing the Iranian-made Zolfaqar MBT, an M-48/M-60-like tank.
- Has upgraded to T-54/T-54 called "Safir-74. Claims to have upgraded Iraqi T-54s captured in Iran-Iraq War. Has 400 T-54/55 in inventory. Number of upgrades unknown.
- Purchased Russian BMPs. Inventory of 300 BMP-1s and 140 BMP-2s in 2000. The IISS, reports a possible additional 100 BMP-2 kits ordered in 1989 and delivered in 1998.
- Russia may be licensing Iranian production of T-72 and BMP-2.
- Claims domestic production of a Chinese version of the BMP called the Boragh.
- Claims Domestic production of an APC called the BMT-2 or Cobra.
- Possible purchase of 100 M-46 and 300 D-30 artillery weapons from Russia.
- Testing prototype of 122 mm self-propelled gun called Thunder.
- Has shown a modified heavy equipment transporter called the "Babr 400."
- Russian and Asian AT-2s, AT-3s, and AT-4s. Does not seems to include 100 Chinese Red Arrows.
- Chinese and 15+ North Korean 146 mm self-propelled weapons
- Has 60 Russian 2S1 122 mm self-propelled howitzers in inventory.
- Growing numbers of BM-24 240 mm, BM-21 122 mm and Chinese Type 63 107 mm MRLs
- Iranian Hadid 122 mm - 40 round MRL
- Manufacturing Iranian Arash and Noor rockets (variants of Chinese and Russian 122 mm rockets)
- Manufacturing Iranian Haseb rockets (variants of Chinese 107 mm rocket)
- Manufacturing Iranian Shahin 1 and 2, Oghab, Nazeat 5 and 10 (may be additional versions), and Fajr battlefield rockets

AIR/AIR DEFENSE

- Keeping up to 115 combat aircraft that Iraq sent to Iran during Gulf War. Seem to include 24 Su-4s and four MiG-29s.
- Has 30 MiG-29s with refueling in inventory, may be receiving 15-20 more from Russia
- Has 24-30 Su-24s in inventory (probably Su-24D version), may be receiving 6 to 9 more from Russia
- May be negotiating purchase of AS-10, AS-11, AS-12, AS-14/16s from Russia
- Has Su-25s (formerly Iraqi), although has not deployed.
- May be trying to purchase more Su-25s, as well as MiG-31s, Su-27s and Tu-22Ms
- Considering imports of Chinese F-8 fighter and Jian Hong bomber
- Has 25 Chinese F-7M fighters with PL-2, PL2A, and PL-7 AAMs.

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- IISS reports that Iran bought 14 Y-7 transports and 10 F-7 fighters from China in 1996 and these were delivered in 1998.
- Has purchased 25 Brazilian Tucano trainers and 25 Pakistani MiG-17 trainers. Uncertain report has bought 12 MiG-29UB trainers from Russia.
- Has bought 12 Italian AB-212, 20 German BK-117A-3, and 12 Russian Mi-17 support and utility helicopters.
- Iran claims to have fitted F-14s with I-Hawk missiles adapted to the air-to-air role
- Claims to produce advanced electronic warfare systems.
- IRGC claims to be ready to mass produce gliders.

LAND-BASED AIR DEFENSE

- May be negotiating purchase of S-300 and more SA-14/16s from Russia
- Has acquired four HQ-23/2B (CSA-1) launchers and 45-48 missiles, plus 25 SA-6, and 10 SA-5 launchers.
- Has acquired Chinese FM-80 launchers and a few RBS-70s
- More SA-7s and HN-5s man-portable missiles; may have acquired 100-200 Strelas.
- Reports is seeking to modernize Rapier and 10-15 Tigercat fire units
- May be modifying and/or producing ZSU-23-4 radar-guided anti-aircraft guns.
- Claims to produce advanced electronic warfare systems.

SEA

- Claims will soon start producing 6 multi-purpose destroyers.
- Has taken delivery on three Russian Type 877EKM Kilo-class submarines, possibly with 1,000 modern magnetic, acoustic, and pressure sensitive mines.
- Wake-homing and wire-guided Russian torpedoes: TEST 71/96 HWT/LWT).
- Reports has North Korean midget submarines have never been confirmed
- Has obtained 10 Hudong-class Chinese missile patrol boats with CS-802.
- US Mark 65 and Russian AND 500, AMAG-1, KRAB anti-ship mines
- Reports that Iran is negotiating to buy Chinese EM-52 rocket-propelled mine
- Iran claims to be developing non-magnetic, acoustic, free-floating and remote controlled mines. It may have also acquired non-magnetic mines, influence mines and mines with sophisticated timing devices.
- Seersucker (HY-2) sites with 50-60 missiles - Iran working to extend range to 400 km.
- Has 60-100 Chinese CS-801(Ying Jai-1 SY-2) and CS-802 (YF-6) SSMs.
- Iran is developing FL-10 anti-ship cruise missile which is copy of Chinese FL-2 or FL-7.
- Boghammer fast interceptor craft

MISSILES

- Obtained up to 250-300 Scud Bs with 8-15 launchers

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- Up to 150 Chinese CSS-8 surface-to-surface missiles with 25-30 launchers.
- Reports that China is giving Iran technology to produce long-range solid fuel missile
- Iran-130 missile (?)
- Has bought North Korean Scud Cs with 5-14 launchers
- South Korea reports Iran has bought total of 100 Scud Bs and 100 Scud Cs from North Korea.
- May be developing the Zelzal-3 missile with a range of 900 kilometers with Chinese and North Korean support.
- Iran may be planning to purchase North Korean No-Dong 1/2s
- Iran also interested in North Korea's developmental Tapeo Dong 1 or Tapeo Dong 2.
- Claims will launch its first experimental satellite by 2000 with Russian aid.
- Reports of tunnels for hardened deployment of Scuds and SAMs.

CRRN/WMD

- Chemical weapons (sulfur mustard gas, hydrogen cyanide, phosgene and/or chlorine; possibly Sarin and Tabun)
- Biological weapons (possibly Anthrax, hoof and mouth disease, and other biotoxins)
- Nuclear weapons development (Russian and Chinese reactors)

Iran's Problems with Obsolescence

At the same time, Iran still has a force structure filled with obsolete and obsolescent military equipment. It is far from clear that Iran's procurements shown are offsetting the steady decay of Iran's older equipment. Its Western equipment is now at least two decades old and received hard use during the Iran-Iraq War. Most of the equipment it bought during the Iran-Iraq War consisted of relatively low grade North Korean and Chinese equipment and few of its indigenous production efforts have yet gone beyond the prototype stage. Iran's holdings of aging and obsolete equipment include:[403]

LAND FORCES

- Chieftain tank 140 Worn, under-armored, underarmed, and underpowered. Fire control and sighting system now obsolete. Cooling problems.
- M-47/M-48 150 Worn, under-armored, underarmed, and underpowered. Fire control and sighting system now obsolete.
- M-60A1 150-160 Worn, under-armored, underarmed, and underpowered. Fire control and sighting system now obsolete.
- Scorpion AFV 70-80 Worn, light armor, underarmed, and underpowered.
- M-114s? 70-80 Worn, light armor, and underarmed, and underpowered

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- M-113s 250 Combat worn, not modernized
- M-109 155 mm SP 150-160 Worn, Fire control system now obsolete. Growing reliability problems due to lack of updates and parts.
- M-107 175 mm SP 20-30 Worn, Fire control system now obsolete. Growing reliability problems due to lack of parts.
- M-110 203 mm SP 25-30 Worn, Fire control system now obsolete. Growing reliability problems due to lack of parts.
- AH-1J Attack heli. 100 Worn, avionics and weapons suite now obsolete. Growing reliability problems due to lack of updates and parts.
- CH-47 Trans. heli. 35-40 Worn, avionics now obsolete. Growing reliability problems due to lack of updates and parts.
- Bell, Hughes, Boeing, Agusta, Sikorsky helicopters 350-445 Worn, Growing reliability problems due to lack of updates and parts.

AIR FORCE

- F-4D/E FGA 35-50 Worn, avionics now obsolete. Critical problems due to lack of updates and parts.
- 60 F-5E/FII FGA 50-60 Worn, avionics now obsolete. Serious problems due to lack of updates and parts.
- F-5A/B 10-20 Worn, avionics now obsolete. Serious problems due to lack of updates and parts.
- RF-4E 8-15 Worn, avionics now obsolete. Serious problems due to lack of updates and parts.
- RF-5E 0-5 Worn, avionics now obsolete. Serious problems due to lack of updates and parts. (May be in storage)
- F-14 AWX 60 Worn, avionics now obsolete. Critical problems due to lack of updates and parts. Cannot operate some radars at long ranges. Phoenix missile capability cannot be used.
- P-3F MPA 5 Worn, avionics and sensors now obsolete. Many sensors and weapons cannot be used. Critical problems due to lack of updates and parts.
- Key PGMs - Remaining Mavericks, Aim-7s, Aim-9s, Aim-54s are all long past rated shelf life. Many or most are unreliable or inoperable.
- I-Hawk SAM 100 Worn, electronics, software, and some aspects of sensors now obsolete. Critical problems due to lack of updates and parts.
- Rapier SAM 30 Worn, electronics, software, and some aspects of sensors now obsolete. Critical problems due to lack of updates and parts.
- Tigercat SAM 15 Worn, electronics, software, and some aspects of sensors now obsolete. Critical problems due to lack of updates and parts.

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NAVY

- Alvand FFG 3 Worn, weapons and electronics suite obsolete, many systems inoperable or partly dysfunctional due to Critical problems due to lack of updates and parts.
- Bayandor FF 2 Obsolete. Critical problems due to lack of updates and parts.
- Hengeman LST 4 Worn, needs full scale refit.
- Riazi MSC 2 Obsolete US ships.
- P-3F Orion MPA 3 Now obsolete. Not modernized or upgraded since 1978.
- SH-3D, AB-212 ASW 20 Worn, obsolescent ASW helicopters.

Iran and Conventional Warfighting

Iran is too weak to seek a direct conflict that involves the US, or to risk another war with Iran. It will also be years before Iranian arms imports and military production efforts can give it enough capability to deliberately initiate a conflict or reveal whether it has aggressive intentions. Iran can threaten shipping traffic in the Gulf, but its acquisitions do not give it any hope of winning a naval-air battle against US forces in the Gulf, and it has little chance of doing so in the foreseeable future.

Iran would have to rebuild and modernize both its regular navy and air force at levels of strength and capability it simply cannot hope to achieve in the next decade. Alternatively, it would need to develop its capabilities to deliver weapons of mass destruction to the point where it could back its conventional military capabilities with a threat that might seriously inhibit US military action and/or the willingness of Southern Gulf states to support the US and provide air and naval facilities.

The "wild cards" determining the outcome of such contingencies are the US determination to act, the size of the US presence in the Gulf and US power projection capabilities at the time of a given crisis, Southern Gulf support for the US and willingness to provide the US with suitable facilities, and the political liabilities the US would face -- if any -- in terms of the response from nations outside the region. Far more is involved in a confrontation in the Gulf than military capability, and Iran would have far more contingency capability if the US could not respond for

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political or budgetary reasons.

Iran could also try to threaten US interests indirectly and through asymmetric wars. Iran has a major capability to engage in asymmetric warfare in the Gulf. It could covertly lay free floating mines, launch hit and run attacks against offshore oil platforms and shipping with its missile patrol boats, and invade and occupy offshore facilities with the naval branch of its Revolutionary Guards. At the same time, it cannot project power across in the Gulf in the face of US opposition, and has never really exercised large-scale over-the-beach amphibious operations. Furthermore, there is little present near-term prospect that Iran will develop enough power projection capability -- and supporting power from its navy and air force -- to win a conflict in the Southern Gulf that involves US forces, or to force its way in support of a coup or uprising.

At the same time, the US might still have problems in exploiting its military superiority and the "revolution in military affairs" to counter Iranian military involvement in the Southern Gulf:

- Iran might seek to exploit the fracture lines and political unrest within and between the Southern Gulf states. This is particularly true of the Shi'ite in Bahrain and Saudi Arabia, but it might also prove true of future confrontations between Bahrain and Qatar and Saudi Arabia and Yemen.

- The US would face serious problems in responding to any change of government in a Southern Gulf state that resulted in a pro-Iranian regime and which sought Iranian military advice or an Iranian military presence. The US cannot save a Gulf regime from its own people or (openly) endorse such action by other Southern Gulf countries.

- Iran's process of creeping proliferation is making enough progress that the US and the Southern Gulf states must reach some degree of agreement on taking suitable counter-proliferation measures. A power vacuum in which Iran proliferates, the Southern Gulf states grow steadily more vulnerable, and US resolve seems progressively more questionable could give Iran far more capability to directly or indirectly intervene in Southern Gulf affairs.

- Iran might threaten regional stability by exploiting internal unrest and divisions in Iraq that are serious enough to split the Iraqi armed forces, and/or lead to a new Shi'ite uprising. Similarly, a major Kurdish uprising would greatly complicate Iraq's ability to concentrate its forces to defend against an Iranian attack on Iraq's center and south. At the same time, any Iranian victory over Iraq might prove to be more apparent than real. It would be dependent on US toleration of such an Iranian victory that did more than depose the present Iraqi regime. Further, the split between Persian, Arab, and Kurd seems likely to remain so great that Iraqi independence would rapidly reassert itself if Iran attempted to occupy or dominate a substantial part of Iraq.

The previous contingencies assume that Iran will take offensive action. If it does, it may well be confronted with a US-led attack on Iran. If this attack is confined to naval and coastal

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targets, particularly those Iranian military capabilities that potentially threaten Gulf shipping, there is little Iran can do militarily to resist US power other than try to ride out the attack by dispersing and hiding its smaller boats, anti-ship missiles, etc.

If a US-led attack includes strategic conventional missile strikes and bombings, there also is little Iran can do in immediate response other than escalate by using weapons of mass destruction. Such an escalation now would almost certainly end in increasing the risk and damage to Iran than deter or damage US forces.

Iran, however, does have potential countermeasures to US conventional superiority and ability to exploit the revolution in military affairs. It can respond over time with terrorism, unconventional warfare, and proxy wars. It is much easier for air and missile power to inflict major damage on Iran than it is to predict or control the political and military aftermath. The resulting casualties and damage will be extremely difficult to translate into an "end game."

Attacks on the Iranian mainland that went beyond a punitive raid would also be much more costly to the US, in spite of the "revolution in military affairs." A US-led coalition could defeat Iran's regular forces, but would have to be at least corps level in size, and occupying Iran would be impractical without massive land forces of several entire corps. Even limited amphibious and land attacks on the mainland would expose the invading forces to a much higher risk of low intensity and guerrilla combat with Iranian forces that would constantly receive reinforcement and resupply. Further, Iran's use of terrorism and weapons of mass destruction would be politically easier to justify in a defensive conflict than an offensive one. Such attacks would probably end in futility, and in creating a revanchist Iran.

Iran and Asymmetric Wars

Iran may also be able to counter US capabilities and achieve some of its objectives through intimidation and direct and indirect threats. Iran's ability to provide such threats and conduct "wars of intimidation," will improve steadily in the near to mid-term, in spite of its military weakness. In many cases, its neighbors may be willing to react to such intimidation by

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accommodating Iran to some degree. This is particularly true of those Southern Gulf states whose gas and oil resources are most exposed -- like Qatar -- or which see Iraq as a more serious threat -- like Kuwait.

Iran has steadily improved the capabilities of the IRGC and the Quds Force for unconventional warfare, including the potential use of chemical and biological weapons. Iran has also demonstrated that it is steadily improving its ability to conduct "proxy wars" by training, arming, and funding movements like the Hezbollah.

Iran also is steadily improving capabilities for information warfare and cyberterrorism, although it seems unlikely that it is capable of advanced attacks on protected US military and US government computer, information, and battle management systems. Iran probably has more capability to attack the US private sector and the systems of Gulf states. It also is almost certainly improving the defense of its own systems, which often are land-based and require little more than isolation from netted or open systems to provide a first line of defense.

These capabilities allow Iran to conduct the kind of low-level and/or covert asymmetric warfare where the "revolution in military affairs" as of yet has only limited value. At the same time, any use of such forces is unlikely to drive the US out of the Gulf, and would risk alienating the Southern Gulf or states without defeating them. The November 1995 bombing of the National Guard training center and June 1996 bombing of the Al Khobar Towers in Saudi Arabia may have demonstrated American vulnerabilities, but it is far from clear that it provided anyone with strategic benefits. As for proxy wars, it is unclear what terrorist movements are willing to accept such Iranian support and pay the probable political price tag.

Iran and Proliferation

Iran’s effort to acquire chemical, biological, and nuclear weapons -- and suitable long-range strike systems -- are described in detail in the chapter IX. However, weapons of mass destruction do not necessarily make radical changes in Iran’s contingency capabilities. At the same time, Iran’s current success in proliferating does give Iran a post-Gulf War edge over Iraq. It also

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inevitably affects US, British, Israeli and Southern Gulf perceptions of the risks inherent in attacking Iran.

Much depends upon their perceptions of the risk in engaging Iran, refusing its demands, and dealing with Iranian escalation and/or retaliation. It seems unlikely that Iran's "creeping proliferation" will reach the point in the near term where Iran's capabilities are great enough to change US, British, Israeli and/or Southern Gulf perceptions of risk to the point where they would limit or paralyze outside military action. Further, it seems unlikely that Iran can continue to build up its capabilities without provoking even stronger US counter-proliferation programs, including retaliatory strike capabilities. The same is true of a response from Iraq and the Southern Gulf states. As a result, Iran's "creeping proliferation" may end simply in provoking a "creeping arms race."

Such arms races do not, however, always bring deterrence and stability. There are at least four contingencies that would challenge US regional influence that deserve attention:

- A successful Iranian attempt to buy significant amounts of weapons grade material that suddenly shifted proliferation from "creeping" to an active and regionally destabilizing threat and potential counter to US conventional capabilities.
- Iranian acquisition of highly lethal biological weapons and/or change in the US and regional perception of biological weapons.
- A case of lateral escalation in which Iraq found a way to end UN sanctions and/or reveal a substantial break-out capability of its own, creating the risk of a new Iran-Iraq War using weapons of mass destruction that could affect two countries with over 15% of the world's oil reserves and which could spillover into other Gulf states.
- Iranian use of such weapons through proxies or in covert attacks where it had some degree of plausible deniability.

Developments in Iraq: Bound by Sanctions and Ineptness

The Gulf War did not change Saddam's fundamental behavior. Neither did the "war of inspections," Desert Fox, or the long series of US and British air strikes that followed. At the same time, Iraq faces massive military problems. A near-decade of sanctions have blocked arms and technology imports for both conventional forces and weapons of mass destruction, and Iraq

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has never succeeded in building up regional alliances with other states or extremist movements of a kind that enhance its capabilities for asymmetric warfare.

Iraq's leadership shows less realism and ability to focus on real-world war fighting needs than the leadership of Iran. Iraqi military officers probably understand most aspects of the "revolution in military affairs," at least in terms of the advantages of advanced technology. Iraq's leadership has only demonstrated limited ability to agree on a cohesive pattern of military modernization in the past, and go beyond flooding the Iraqi military with imports and create an integrated approach to war fighting that gives proper weight to joint and combined operations, training, sustainment, and C^4I.

Iraqi Force Changes and Post-Gulf War Actions

Iraq's response to containment has been highly politicized, often to Iraq's military disadvantage. Saddam Hussein's extremism and recklessness has often served to reinforce and prolong UN sanctions, alienate Iraq's neighbors, provoke new strikes on Iraqi forces, and ensure that Iraq cannot openly import arms and technology. At the same time, Iraq has taken actions that do challenge US power and ability to exploit the "revolution in military affairs:

- Iraq has reconstituted and reorganized the conventional forces that survived the Gulf War, concentrating its remaining assets on its first line heavy divisions and more modern aircraft. It remains the largest and more effective land force in the Gulf. It has used its forces to virtually destroy the remaining Shi'ite resistance in the marsh areas in the south, and to invade the Kurdish security zone in the North. It has also created the capability to rapidly deploy at least five heavy divisions against Kuwait.

- Iraq has gone on with its long-range missile and chemical, biological, and nuclear weapons programs even at the cost of prolonging UN sanctions and inspections for nearly a decade longer than was originally anticipated. It demonstrated during the crisis that led to Desert Fox that it was willing to absorb major US and British air and missile strikes to force an end to UNSCOM and IAEA inspections

- Iraq has conducted highly political and asymmetric wars against its Kurds and Shi'ites. In the case of the Kurds, it has linked military containment (a large number of Iraq's forces are deployed near the border of the security zone in the north) to continuing political efforts to exploit the divided Kurdish factions – a strategy that allowed it to invade the Kurdish security zone with the support of one faction against another and which made it extremely difficult for the US to make any direct military response. In the south, it effectively linked military, economic, and environmental warfare by combining small, dispersed land force operations with the draining of the marsh areas that rebel Shi'ites used as sanctuaries. In both cases, it used intelligence and security officers in conjunction with military forces to intimidate and subvert and sometimes to substitute paramilitary operations for conventional military operations. At the same time,

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Iraq has repeatedly probed the Kuwaiti border, testing US and Gulf resolve and keeping up a constant low-level pressure in an effort to intimidate Kuwait and its neighbors.

Iraq has not yet been particularly successful in these efforts. Its relentless refusal to comply with UN sanctions, lies about its efforts to proliferate and failure to comply with UN inspections and the terms of the Gulf cease-fire agreement, refusal to accept an "oil for food agreement" for half a decade, and Saddam Hussein's clumsy political excesses have been something of a disaster. They have transformed a potentially clever mix of political counters to UN sanctions, US military superiority, and the "revolution in military affairs" into a self-inflicted wound. It is far from clear, however, that such tactics will be so ineffective if the future – even a vainglorious Saddam Hussein, can learn -- and a quieter and subtler successor might exploit them with considerably greater success.

Modernization and Arms Transfers

Anyone who discussed military affairs with Iraqi officers during the Iran-Iraq War became aware of the fact that many mid-ranking and senior officers had an excellent understanding of developments in the West, the impact of military technology, and the need to adopt modern tactics. At the same time, it was also clear that Saddam Hussein showed only limited patience with the real-world constraints in shaping military forces, and took a an ambitious and highly political approach to buying arms and shaping Iraq's efforts to acquire weapons of mass destruction. Iraq's military elite never been composed of those commanders who performed best in combat or who provided honest cost and effectiveness solutions to modernizing Iraq's military forces. It is composed of those who feed and support Saddam Hussein's ambitions and preconceptions and who seem unambiguously loyal to his leadership and his person.

These problems severely limited Iraq's ability to exploit its massive advantage over Iran in access to arms and military technology throughout most of the Iran-Iraq War, and Iraq has faced far greater problems since the UN first imposed sanctions on its imports of arms and technology in August, 1990. Since that time, Iraq has faced major problems in every aspect of its military modernization because of UN sanctions, the efforts of the US and other states to deny it the

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transfer of sensitive and dual-use military technologies, and the impact of post-Gulf War strikes on Iraq like Desert Fox. It has faced similar limits its deployments and training because of sanctions, the “no fly” zones, and nearly continuous engagement in internal security operations. At the same time, there have been recurrent purges and reorganizations in Iraq’s military forces that have been designed to ensure Saddam’s security, and enhance the efficiency of Iraqi internal security operations, almost all of which have undercut or disrupted Iraqi military professionalism.

The Impact of Military Sanctions

The most important factor limiting Iraq’s ability to react to the lessons of the Gulf War is that Iraq has always been a nation that has relied on massive imports of advanced weapons and technology to make up for its own mediocre military skills has had virtually no arms imports since 1990. Even before the Gulf War, Iraq would have needed about $1.5 billion a year of imports to sustain its military machine. Iraq’s massive equipment losses during the Gulf War have reduced its need for imports to sustain existing systems, but they have created a massive new set of requirements to rebuild Iraq’s forces and act on the lessons of the Gulf War.

Iraq does have major production facilities. These include the following key plants, facilities and research centers:

- Tank assembly plant operating under Polish and Czech licenses at Al-Amen.
- Major armor refitting center at Base West World (Samawa).
- Manufacture of proximity fuses for 155 mm and cluster munitions at April 7 (Narawan Fuse) Factory.
- Manufacture of 122 mm howitzers, Ababil rockets, tank optics and mortar sights at Sa'ad 5 (Sa'ad Engineering Complex).
- Manufacture of wheeled APCs under East European license, other armor, and artillery pieces at Al Taji).
- Manufacture and repair of artillery, vehicle parts, and cannon barrels at SEHEE heavy engineering complex (Al Dura).
- Aircraft assembly and manufacturing plant under construction at Sa'ad 38. (Fao)
- Manufacture of aerial bombs, artillery pieces, and tungsten-carbide machine tool bits at Badr (al Yusufiyah).
- Production of explosives, TNT, propellants, and some vehicle production capability at Al Hiteen (Al Iskandariyah).

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- Production of cluster bombs and fuel-air explosives at Fao.
- Production of aerial bombs, TNT, and solid rocket propellants at Al Qaqaa.
- Manufacture of small naval boats at Sawary (Basra).
- Production and modification of defense electronics at Mansour (Baghdad).
- Production and modification of defense electronics, radars, and frequency-hopping radios at Sa'ad 13 (Salah al Din - Ad Dawr).
- Digital computer software, assembly of process line controllers for weapons plants, and plastic castings at Diglia (Zaafarniyah).
- Precision machining at Al Rabiyah.
- Manufacture of non-ferrous ammunition cases at Sa'ad 21 (Mosul).
- Liquid nitrogen production at Al Amil.
- Production of ethylene oxide for fuel-air explosives at PCI.
- Production of HMX and RDX explosives at Fallujah chemical plant at Al Muthanna.

Most of these facilities, however, are now more Potemkin showpieces than real military production capabilities. Iraq did develop significant ammunition, small and light arms, and gun barrel production facilities before the Gulf War, and many survive and still function. However, Iraq focused most of its military industry resources on weapons of mass destruction and its pre-1991 military production efforts were heavily prototype-oriented and largely prestige-oriented in nature. It left sophisticated service and maintenance activity largely (e.g. French and Russian aircraft) to foreign technical support teams. Did not attempt to develop major in-house capabilities. It did successfully import some T-72 kits, in theory as a transition to production facilities, but never actually developed the industrial base for such manufactures. Iraqi modifications sometimes succeeded, but most failed and had an “impress the maximum leader character.” For example, the Gulf War showed that most of its T-72 upgrades were technically incompetent.

It is also important to note that the assembly of major weapons has rarely led to effective technology transfer, or effective reverse engineering capability, without extensive on-going foreign support. The net impact of most such assembly activity is to create over-specialized facilities, waste resources. No developing state, including India and China, has yet demonstrated that it can successfully mass manufacture an advanced fighter plane or tank, even on a turn-key

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basis. In fact, few nations have made useful major equipment upgrades for armor and aircraft. Jordan and South Korea, Turkey are among few successes. Egypt, India, Pakistan are more typical.

Iraq has effectively been cut off from all major imports of parts and specialized equipment since 1990, although dual use items, civilian electronics and sensors, and computer gear are not effectively controlled. As a result, its black market imports, substitution, and local manufactures, can only provide an erratic and inefficient substitute for large scale resources.

As a result, Iraq faces a massive recaptilization problem. While it is impossible to make reliable estimates, it is difficult to see how Iraq could recapitalize and modernize its conventional forces for less than $35 to $50 billion dollars over a five to ten year period. Even if all sanctions stopped today, it would also take at least half a decade for Iraq to buy and receive deliveries on such orders. Like Iran, Iraq's military industries also have severe limits in producing advanced military equipment, and Iraq has shown far more prototypes than it has ever produced and deployed. Iraq has had no choice other than to smuggle what it can, and seek to eventually transform its military industries from centers of vainglorious rhetoric to centers of actual production.

Obsolescence in Iraqi Forces

The Gulf War and the sanctions that have followed have left Iraq dependent on the following aging, worn, or obsolescent military systems:

LAND FORCES

- 600-700 M-48s, M-60s, AMX-30s, Centurions, and Chieftains captured from Iran or which it obtained in small numbers from other countries.
- 1,000 T-54, T-55, T-77 and Chinese T-59 and T-69 tanks
- 200 T-62s.
- 1,500-2,100 (BTR-50, BTR-60, BTR-152, OT-62, OT-64, etc
- 1,600 BDRM-2, EE-3, EE-9, AML-60, AML-90
- 800-1,200 towed artillery weapons (105 mm, 122 mm, 130 mm, and 155 mm).

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- Unknown number of AS-11, AS-1, AT-1, crew-portable anti-tank-guided missiles.
- More than 1,000 heavy, low-quality anti-aircraft guns.
- Over 1,500 SA-7 and other low-quality surface-to-air guided missile launchers & fire units.
- 20 PAH-1 (Bo-105); attack helicopters with AS-11 and AS-12, 30 Mi-24s and Mi-25s with AT-2 missiles, SA-342s with AS-12s, Allouettes with AS-11s and AS-12s.
- 100-180 worn or obsolete transport helicopters.

AIR FORCE

- 6-7 HD-6 (BD-6), 1-2 Tu-16, and 6 Tu-22 bombers.
- 100 J-6, MiG-23BN, MiG-27, Su-7 and Su-20.
- 140 J-7, MiG-21, MiG-25 air defense fighters.
- MiG-21 and MiG-25 reconnaissance fighters.
- 15 Hawker Hunters.
- Il-76 Adnan AEW aircraft.
- AA-6, AA-7, Matra 530 air-to-air missiles.
- AS-11, AS-12, AS-6, AS-14; air-to-surface missiles.
- 25 PC-7, 30 PC-9, 40 L-29 trainers.
- An-2, An-12, and Il-76 transport aircraft.

LAND –BASED AIR DEFENSE

- 20-30 operational SA-2 batteries with 160 launch units.
- 25-50 SA-3 batteries with 140 launch units.
- 36-55 SA-6 batteries with over 100 fire units.
- 6,500 SA-7s.
- 400 SA-9s.
- 192 SA-13s

NAVY

- *Ibn Khaldun*.
- Osa-class missile boat.
- 13 light combat vessels.
- 5-8 landing craft.
- *Agnadeen*.
- 1 Yugoslav Spasilac-class transport.
- Polnocny-class LST.

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Much depends on whether the West and other Gulf states understand the fact that they have a vital long-term interest in maintaining export controls on weapons and dual-use items, and trying to resume some form of inspections by bodies like UNSCOM and the IAEA. They need to understand that they must make every effort to bloc Iraq from producing equipment that it cannot imports, and that arms control negotiations with Iraq will be an extension of the "war of sanctions" by other means, and that only strong military forces and counter-proliferation efforts can deter and defend against Iraq's break out capabilities and a post-sanctions expansion of its proliferation effort. The world has to learn to live with the true nature of Iraq's "strategic culture" and its unpredictability and opportunism.

Iraq and Conventional Warfighting

As is the case with Iran, it makes far more sense to talk about Iraqi capabilities in a range of contingencies than to talk about Iraqi intentions or to focus on specific scenarios. Iraqi rhetoric is now defensive to the point of being paranoiac, and clashes like Desert Fox have showed that Iraq is too weak to openly seek a direct conflict that involves the US or to risk another war. It will be years after sanctions are finally lifted before Iraqi arms imports and military production efforts can give it enough capability to deliberately initiate a conflict or reveal whether it has aggressive intentions.

Nevertheless, Iraq does have some near-term contingency capabilities that might allow it to exploit the limits to US capabilities and the "revolution in military affairs." Iraq's land forces still retain significant warfighting capabilities and much of the force structure that made Iraq the dominant military power in the Gulf after its victory over Iran. Iraqi forces can still seize Kuwait in a matter of days or occupy part of Saudi Arabia's Eastern Province, *if* they do not face immediate opposition from US, Kuwaiti, and Saudi forces.

An Attack on Kuwait or Saudi Arabia

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USCENTCOM and US experts indicate that Iraq could assemble and deploy five heavy divisions south into Kuwait in a matter of days. It has a total of five Republican Guard divisions within 140 kilometers of Kuwait. Iraqi divisions now have an authorized strength of about 10,000 men, and about half of the Iraqi army's 23 divisions had manning levels of around 8,000 men and "a fair state of readiness." Republican Guards divisions had an average of around 8,000 to 10,000 men. Brigades averaged around 2,500 men -- the size of a large US battalion.

A background briefing by USCENTCOM indicates that Kuwait could only rapidly deploy a few combat strength battalions to defend its territory, and Saudi Arabia would take days to deploy even one heavy brigade into areas north of Kuwait City. The tyranny of geography, Kuwait's small size, and Saudi Arabia's widely dispersed army give Iraq a natural advantage in any sudden or surprise attack.

The failure of Kuwait and Saudi Arabia to make more than limited cooperative defense efforts compounds the problem, as does Saudi Arabia's poor performance in modernizing its land forces and giving its air force offensive capability. While Saudi Arabia and Kuwait have developed relatively effective air forces at the squadron level, they cannot fight as integrated air forces without massive US assistance and would still face major problems in coalition warfare.

The Problem of the Land Balance in the Upper Gulf

The land balance in the Upper Gulf is the key weakness in US and allied capabilities and ability to defend Kuwait and Northwest Saudi Arabia, and a weakness where the delays in power projection potentially limit the US ability to exploit the "revolution in military affairs." The US has elements of one heavy brigade prepositioned in Kuwait, but it takes at least 14-21 days to fully man, deploy, and sustain this brigade. The US can deploy another two relatively light brigades in fully combat ready form in 18-30 days. Kuwait dreamed of a 12 brigade force after the Gulf War, but it only has two understrength active brigades and two reserve brigades. Its land forces total only 11,000 personnel, and this total includes 1,600 foreign contract personnel, most of whom are non-combatants. The total manpower of the Kuwaiti armed forces, including the air force and

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navy, total about one US brigade "slice" (combat manpower plus support). The Kuwaiti army has an active tank strength of only about 75 M-84s (Yugoslav T-72s) and 174 M-1A2s..

The Saudi army has reverted to a static defensive force that has limited effectiveness above the company and battalion level. Although it claims to have 70,000 full time regulars in the army, plus 57,000 active members of the National Guard, actual manning levels are significantly lower. Some of its M-1A2 tanks are still in storage, plus about 145 of its 295 obsolescent AMX-30s. As a result, Saudi Arabia relies heavily on its 450 M-60A3s. This is still a significant amount of armor, but it is dispersed over much of the Kingdom, and Saudi Arabia lacks the training, manpower quality, sustainability, and C4I/SR capabilities for effective aggressive maneuver warfare and forward defense. While there are reports of a Gulf Cooperation Council (GCC) rapid reaction force, the reality is a few hollow allied battalions. As has been discussed earlier, the GCC is a military myth.

The Critical Role of US Air and Missile Power

Unless there are weeks of strategic warning, Kuwait, Saudi Arabia, and the US will lack the land forces to stop Iraq without immediately committing massive amounts of air and missile strikes against the advancing Iraqi forces and Iraqi strategic targets. A force of five Iraqi divisions would compare favorably with total Kuwaiti forces of about four brigades, with only about a brigade equivalent combat-ready, and with a total forward-deployed US strength that normally does not include a single forward-deployed land brigade. The Saudi forces at Hafr al Batin are at most the equivalent of two combat-effective brigades which would probably take two weeks to fully deploy forward to the Kuwait and Saudi borders in sustainable, combat-ready form. The so-called GCC rapid deployment force is largely a political fiction with no meaningful real-world combat capability against Iraqi heavy divisions.

There is little prospect that this situation will improve in the near term. The US has not been able to preposition large numbers of equipment sets in or near Kuwait, and prepositioning brigade sets in Qatar and the UAE means that such forces would take at least a week to 10 days

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to deploy in combat-ready form in Kuwait. Kuwait is making only limited progress in its military modernization, and the Saudi Army has made little progress in improving its capability to move quickly to the defense of Kuwait or to concentrate its forces along the Saudi border with Iraq.

As a result, the ability to deal with a sudden Iraqi attack on Kuwait is likely to depend on US ability to mass offensive air and missile power and use it immediately against Iraq the moment major troop movements begin without first seeking to win air superiority or air supremacy. It will depend on US willingness and ability to couple strikes against Iraqi leadership and strategic targets to this offensive in an effort to force Iraq to halt its offensive, and US ability to deter, defend, and retaliate against any Iraqi use of weapons of mass destruction. The US will also require the full support of Saudi Arabia and the other Southern Gulf countries to assist in the deployment and basing of US forces in the region, support from friendly local forces like the Saudi Air Force, and a firm and immediate Kuwaiti willingness to allow the US and Saudi Arabia to employ force.

Even then, preventing an Iraqi occupation of Kuwait City will be a difficult task, and the US could be confronted with an asymmetric war in which Iraq ruthlessly exploited the suffering of the Iraqi people to force a halt to US military action. Kuwaiti government security experts have, in fact, postulated a far worse case in which Iraq uses overt or covert attacks with biological weapons to effectively destroy Kuwait as a nation and create new facts on the ground.

The Defense of Kuwait as a “Close Run Thing”

Defending Kuwait will be an increasingly "close run thing" the moment Iraq can escape the effect of sanctions of its ability to modernize and rebuild its war fighting capability Even today, Iraqi land forces might penetrate into Kuwait City in spite of US, Saudi, and Kuwaiti air power -- if Iraq was willing to take very high losses in reaching and seizing the city. If Iraq then took the Kuwaiti population hostage, it might succeed. USCENTCOM experts privately guess that the US would at best have a 50-50 chance The only way that Iraqi forces could then be

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dislodged would be through a combination of another land build up in Saudi Arabia by the US and allied forces, and a massive strategic/interdiction air campaign against targets on Iraqi territory.

The essential dilemma in any "second liberation" of Kuwait would be US, Saudi, and Kuwaiti willingness to act in the face of potential massacres of Kuwaiti civilians, versus the willingness of an Iraqi regime to accept massive damage to Iraq. It seems likely that the US and Saudi Arabia would show the necessary ruthlessness if the Kuwaiti government supported such action. Oil is too strategically important to cede such a victory to a leader like Saddam Hussein.

The outcome may change, however, as UN sanctions ease or end, and Iraq rebuilds more of its military capabilities. There are a number of ways in which Iraq might then increase the challenge it could pose to US capabilities and the "revolution in military affairs" without acquiring similar military technologies and capabilities:

- Iraq may somehow obtain nuclear weapons, or demonstrate the possession of highly lethal biological weapons.
- The US might be forced to reduce its forward presence and readiness in the Gulf to the point where it could not rapidly deploy air power, and/or had reduced its overall power projection capabilities. This could occur either as a result of US domestic political and funding issues, or added Iranian and Iraqi success in their diplomatic campaigns to limit the US role in the region.
- Iraq may choose a more limited and "acceptable" objective like restoring its pre-Gulf War border or demanding access to Bubiyan, Warbah, the Kwar Abdullah, and the Gulf. This might make it harder for the US to obtain support from its other regional allies and/or nations outside the Gulf.
- Improvements in relations with Saudi Arabia might create a situation where Saudi Arabia may not immediately and fully support US action and commit its own forces.
- A Kuwait government may feel it faces so serious an increase in the Iraqi threat that it would refuse to accept the cost of continuing to fight in the face of ruthless Iraqi action against a "hostage" Kuwaiti people.

Iraq in Contingencies that Do Not Involve Kuwait

The situation is far move favorable in any Southern Gulf contingency that does not involve Kuwait. Iraq has almost none of the assets necessary to win a naval-air battle against US forces in

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the Gulf, and has no prospect of acquiring these assets in the foreseeable future. It would have to rebuild, modernize, and massively expand both its regular navy and air force at levels of strength and capability it simply cannot hope to achieve for the next half-decade. Alternatively, Iraq could develop its capabilities to deliver weapons of mass destruction to the point where it could back its conventional military capabilities with a threat that might seriously inhibit US military action and/or the willingness of Southern Gulf states to support the US and provide air and naval facilities.

Unlike Iran, Iraq cannot conduct meaningful surface ship, naval air force, and amphibious operations. Currently, the Iraqi navy can only conduct limited mine warfare and land-based anti-ship missile attacks, and surprise raids on off-shore facilities. Its air force may be able to conduct limited anti-ship missile attacks using its Mirage F-1s, but would have to find a permissive environment to survive. Iraqi Mirage F-1s burdened with the AM-39 Exocet would be unlikely to survive Kuwaiti, Saudi, or Iranian air defenses without a level of air escort capability that Iraq cannot currently provide.

Iraq has little ability to intimidate its neighbors into accepting such operations as long as the US has the ability to use its air and missile power to inflict enough strategic damage on Iraq to create a massive deterrent to any Iraqi escalation to chemical or biological weapons, and back these capabilities with the ultimate threat of US theater nuclear escalation. There is little near-term prospect that Iraq will develop enough power projection capability -- and supporting power from its navy, air force, and weapons of mass destruction -- to win any conflict in the Southern Gulf where it does not attack by land into Kuwait or across the Saudi border. The only exception would seem to be a case where it operated in support of a coup or uprising, or when Iraqi volunteers operated in Southern Yemen in 1994. Any Iraqi attack on a Southern Gulf state is also the contingency most likely to unite the US and the Southern Gulf states and to ensure European and other support for a strong US-Southern Gulf response.

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This does not mean that Iraqi air and/or naval forces could not score some gains from a sudden, well-planned raid in the Gulf or challenge US military capabilities in some ways. Iraq could not sustain any initial success, however, and would probably accomplish nothing more than provoking a US, Southern Gulf, or Iranian reaction that would far offset any advantages Iraq could gain. The only exception might be a proxy unconventional or terrorist attack that allowed Iraq to preserve some degree of plausible deniability.

Other Ways Iraq Might Exploit the Situation

Like Iran, Iraq has other potential ways to challenge US and Southern Gulf military capabilities:

- Nothing can prevent Iraq from exploiting the fracture lines within and between the Southern Gulf states. Iraq has much less capacity than Iran to exploit the Shi'ite unrest in Bahrain and Saudi Arabia, but it might be able to exploit future confrontations between Bahrain and Qatar and Saudi Arabia and Yemen.

- The US would face serious problems in responding to any change of government in a Southern Gulf state that resulted in a pro-Arab/pro-Iraqi regime and which sought Iraqi military advice or an Iraqi military presence. The US cannot save a Gulf regime from its own people or (openly) endorse such action by other Southern Gulf countries.

- Iraq's process of creeping proliferation is making enough progress that the US and the Southern Gulf states must reach some degree of agreement on taking suitable counter-proliferation measures. A power vacuum in which Iraq proliferates, the Southern Gulf states grow steadily more vulnerable, and US resolve seems progressively more questionable, could give Iraq far more capability to directly or indirectly intervene in Southern Gulf affairs.

The challenges Iraq would pose to the US and its allies in such contingencies would be the US determination to act, the future size of the US presence in the Gulf, US ability to deploy its power projection capabilities at the time of a given crisis, US ability to extend its present advantages in conventional war fighting to counterproliferation and the deterrence of the use of weapons of mass destruction, and Southern Gulf support for the US and willingness to provide the US with suitable facilities. They would also be the political liabilities the US would face -- if any -- in terms of the response from nations outside the region. Far more is involved in a confrontation in the Gulf than Iraq's military capability, and Iraq will be able to acquire far more contingency capability if the US could not respond for political or budgetary reasons.

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Similarly, much will depend over time on Iranian, Southern Gulf, and Western reactions to Iraq's efforts to rebuild the naval strike capability of its air force, and to build-up a meaningful navy. A passive response would obviously strengthen Iraq. So would any indifference to Iraqi efforts to improve its access to the Gulf by renewing its pressure on Kuwait to grant Iraq access to Bubiyan and Warbah, or to secure the channels to Umm Qasr. Even then, however, it is difficult to see how Iraq can acquire much contingency capability to challenge US naval and air power.

Iraqi action against Iran would present a different set of challenges to US military capabilities. As is the case with Iran, the US would face major challenges in intervening in a new Iran-Iraq War, and such a conflict could pose a threat to the world's energy supplies and US strategic interests. The cumulative impact of UN sanctions is slowly eroding the capabilities of Iraqi land and air forces relative to those of Iran, however, and Iraq now has only limited ability to use chemical warfare in another Iran-Iraq conflict. Iraq cannot hope to challenge Iran's naval strength or deny Iran naval and commercial access to the Gulf.

The US faces only near to mid-term risks of direct military challenges to the west and northwest. At least in the near-term, Iraq is so weak that it seems unlikely that it would directly provoke Israel by doing anything more than sending limited forces to Jordan or Syria if another major conflict should somehow take place between Israel and its key neighbors. Iraq must also realize that it is extremely unlikely that Israel will show restraint in any future missile war, and would probably escalate to the use of nuclear weapons if Iraq made any attributable use of weapons of mass destruction against Israel's civilian population or large formations of Israeli military forces.

Iraq is more likely to seek a tacit or open Turkish alliance against the Kurds than to seek military confrontation. There are, however, two possibilities for conflict. One is a future Iraqi-Turkish "alliance" in the form of coordinated operations against the Kurds in the northern border area. Such an "alliance" would offer Turkey the prospect of denying its rebel Kurdish factions

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sanctuary and bases in the Iraqi border area, and offer Iraq both support in suppressing its Kurds and the prospect that Turkey would cease its raids across the border. Both nations have a strong incentive to secure the area in order to allow them to improve trade and the security of Iraq's pipeline through Turkey.

As is the case with Iran, the previous contingencies assume that Iraq will take offensive action. If it does, this might lead to a US-led attack on Iraqi soil that went beyond trying to terminate Iraqi aggression.. If such a US attack is confined to naval and coastal targets, particularly those Iraqi military capabilities that potentially threaten Gulf shipping, there is little Iraq can do in the face of US military capabilities other than try to ride out the attack by dispersing and hiding its smaller boats, anti-ship missiles, etc.

If a US-led attack includes strategic conventional missile strikes and bombings designed to overthrow the regime, there is equally little Iraq can do in terms of an immediate response, other than to escalate to using weapons of mass destruction in ways that are more likely to end in increasing the risk and damage to Iraq than to deter or damage US forces. Iraq can, however, respond over time with terrorism, unconventional warfare, proxy wars, and "diplomatic wars." It is much easier to use air and missile power to inflict major damage on Iraq than it is to predict or control the political and military aftermath. The resulting casualties and damage would be extremely difficult to translate into an "end game."

Any US use of amphibious and land warfare to invade Iraq would be considerably more difficult. Iraq can probably mount a significant defense against amphibious attacks on its coastline and islands. It is impossible to dismiss a popular Shi'ite or Kurdish uprising in support of an outside attack, but the most likely response would seem to be that Iraq's population would unite or remain passive while US or Coalition forces were forced to advance over water barriers and through built-up areas. The Iraqi Army might collapse in the face of such an assault, but the Republican Guards is more likely to dig in and defend from positions co-located with Iraq's civil

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population, which would limit the ability to exploit air power. Attacks on Iraqi territory that went beyond a punitive raid might be costly.

A US-led coalition could probably defeat Iraq's forces, but would have to be at least corps level in size, and occupying Iraq would be impractical without massive land forces of several corps. Further, Iraq's use of terrorism and weapons of mass destruction would be much easier to justify politically in a defensive conflict rather than an offensive one. Such outside attacks would probably end in futility, and in creating an even more revanchist Iraq.

Iraq and Asymmetric Wars

The previous contingencies assume that Iraq's ability to challenge US strength will be determined largely by the conventional warfighting capabilities of Iraq's military forces. Iraq may, however, be able to achieve some of its objectives through intimidation and/or direct and indirect threats. Iraq's ability to provide such intimidation is now limited but Iraq certainly understands that asymmetric warfare is a potential counter to US superiority and the "revolution in military affairs," and it will seek to improve its capabilities once UN sanctions are lifted. In many cases, Iraq's neighbors may be willing to increasingly accommodate Iraq to some degree. This is particularly true of those states that see Iraq as a more serious threat -- like Kuwait and Saudi Arabia.

Much will depend upon regional perceptions of the long-term resolve of the US, the ability of the Southern Gulf states to avoid major divisions, and the willingness of the Southern Gulf states to show that they will support a firm US response to Iraq, even at some risk. Much will also depend on the ability of Iraq's leadership to set achievable demands and avoid open confrontation. In broad terms, it seems likely that Iraq's ability to intimidate will slowly improve over time, but there is no way to predict how quickly or by how much.

Unlike Iran, Iraq has never demonstrated much capability to conduct "proxy wars" by training, arming, and funding Arab extremist movements. Iraq does sponsor some extremist and

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terrorist groups, but the end result has done little for Iraq. Iraq also lacks Iran's bases, training centers, and staging facilities in other countries, and the political support of third nations like the Sudan and Syria which are close to the scene of such proxy conflicts. Similarly, Iraq can only hope to win proxy wars fought against vulnerable governments. Attempts to fight such wars will have little impact on a successful Arab-Israeli peace settlement, or in sustaining civil conflict in the face of a government that demonstrates that it has the capacity to govern and deal with its social problems.

Iraq must have some capability for information warfare and cyberterrorism, but it seems very unlikely that it is capable of advanced attacks on protected US military and US government systems. Iraq also probably has little capability to attack the US private sector and the systems of Gulf states. It is, however, steadily improving the defense of its own systems. Most are redundant, rely heavily on buried land-links and optical fibers, and are isolated from netted or open systems.

At the same time, any dramatic failure of the peace process or instability in the regimes in the Gulf and the region might allow Iraq to make more successful use of proxy wars in the future. So would the creation of a radical Arab regime in Jordan, Egypt, or Syria, which might turn to Iraq for support. Iraq also has a strong revanchist motive to use proxy warfare against Israel, Saudi Arabia, and the United States. Similarly, Iraq may seek to improve its capabilities for unconventional warfare, including the use of chemical and biological weapons. The practical problem that Iraq faces will be to find a place and contingency where it could exploit such capabilities that offer more return than using proxies, and which allows Iraq to act at an acceptable level of risk that the US and its allies would not retaliate.

The contingencies where Iraq might be able and willing to take such action include:

- Sending volunteers to Lebanon and Syria under circumstances where such conflicts had broad Arab support, and Israel was sufficiently preoccupied with other threats so that it could not retaliate;
- Actively supporting some opposition force in Iran if it appeared to be a safe way of limiting the Iranian threat or ending Iranian support for anti-Iraqi movements;

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- Supporting an alienated Yemen that offered Iraq a low cost way of using unconventional forces to threaten or put pressure on Saudi Arabia;
- Support of some movement in Turkey likely to gain Iraq broader support in Turkey; and
- The outbreak of a civil conflict in Kuwait or Saudi Arabia.

There is another and very different kind of asymmetric contingency which could seriously challenge US regional military capabilities, and create the kind of asymmetric war that the "revolution in military affairs" is not designed to fight. Iraq's forces have already shown that they have the military strength to defeat its lightly armed Kurds in a matter of weeks if UN forces cease to protect them. The Iraqi army has effectively defeated all serious Shi'ite resistance. It would take a massive uprising, and possibly a major division within Iraq's military forces, for any civil conflict to challenge the regime.

Power is now so centralized among Sunni tribal elites, who control virtually all senior posts in the military and security forces, that any struggle for power seems more likely to take the form of a coup and counter-coup than civil war. Nevertheless, no one can dismiss the possibility that Saddam Hussein will take another major military risk and end in making another strategic mistake. Saddam may well be able to survive the present situation, but not another major defeat. It is possible that the Iraqi military could split over the struggle for power after Saddam, and combine warlordism with regional and ethnic alliances. Any serious north-south split within the army could trigger a significant civil conflict, although it is impossible to predict the resulting balance of power and ethnic and political alignments. Such a struggle might also trigger limited Iranian and Turkish intervention.

As for the Iraqi opposition, its vainglorious claims to military effectiveness are largely meaningless, and it is unlikely that they could assist the US directly in unifying Iraq or creating a new and more desirable regime. The deeply divided Kurdish forces have proved to be more interested in fighting each other than Iraq, and every temporary alliance between the Barzani and Talibani factions has collapsed. The claims of the Iraqi National Congress (INC) to have set up a military force in the Kurdish Security Zone before Iraq reentered the area in 1996 and destroyed

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the INC's operation, consisted of several hundred badly trained and equipped men organized into a force that would have required thousands to be effective. In spite of some US efforts to help create an opposition force, the only way the US could ever count on help would be if part of the regular Iraqi Army defected – something that seems very unlikely.

Iraq and Weapons of Mass Destruction

Iraq has much more serious history of proliferation than Iran. Iraq has seen proliferation as a counter to conventional superiority since the late 1960s. It sought weapons of mass destruction long before the Gulf War showed it what the "revolution in military affairs" and US conventional superiority could accomplish. As a result, it is scarcely surprising that Iraq sees proliferation as its key potential method of countering the US advantage in conventional forces and the RMA, and has been willing to pursue such options in the face of massive economic costs, UNSCOM and IAEA efforts to destroy its remaining capabilities, and the extension of UN sanctions.

In spite of the Gulf War, and nearly eight years of UNSCOM efforts before Iraq forced and end to the UN inspection effort, Iraq still presents a major threat in terms of proliferation. It is all too clear that Iraq may have increased this threat since active UNSCOM and IAEA efforts ended in December 1998. At the same time, Iraq's present holdings of chemical and biological weapons seem to be so limited that they do not constrain US freedom of action, or do much to intimidate Iraq's neighbors.

As is shown in Chapter IX, Iran now has a significant lead over Iraq. As a result, it seems unlikely that Iraq can reach the point, in the near-term, where its capabilities are great enough to change US, British, Iranian, Israeli and/or Southern Gulf perceptions of risk to the point where they would limit or paralyze outside military action. Further, it seems unlikely that Iraq can open build up major production and deployment capabilities without provoking strong US counter-proliferation programs, including retaliatory strike capabilities. The same is true of a response by

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Iran and the Southern Gulf states. As a result, Iraq's acquisition of weapons of mass destruction may end simply in provoking an arms race even when UN sanctions are lifted.

Nevertheless, Iraq's possession of such weapons inevitably affects US, British, Israeli and Southern Gulf perceptions of the risks inherent in attacking Iraq. Once UN sanctions on Iraq are lifted, Iraq may be able to rebuild its strategic delivery capabilities relatively quickly, and any sustained conflict involving weapons of mass destruction could have drastic consequences. This would be particularly true if Iraq could develop advanced biological weapons with near-nuclear lethality, or assemble nuclear devices with weapons grade fissile material bought from an outside source. There might be little or no warning of such strategic developments, and the US might not be willing to counter by extending theater nuclear deterrence to protect its Southern Gulf allies.

As is the case with Iran, there are several other developments that might allow Iraq to use proliferation to pose a near-term threat to US conventional capabilities in the region:

- A successful Iraqi attempt to buy significant amounts of weapons grade material. This could allow Iraq to achieve a nuclear break out capability in a matter of months. Both the US and the region would find it much harder to adjust to such an Iraqi effort than to the slow development of nuclear weapons by creating fissile material in Iraq. It seems likely that the US could deal with the situation by extending a nuclear umbrella over the Gulf, but even so, the Southern Gulf states might be far more responsive to Iraqi pressure and intimidation. Most, after all, are so small that they are virtually "one bomb states;"

- A change in the US and regional perception of biological weapons. Biological weapons are now largely perceived as unproven systems of uncertain lethality. Regardless of their technical capabilities, they have little of the political impact of nuclear weapons. Iraq might, however, conduct live animal tests to demonstrate that its biological weapons have near-nuclear lethality or some other power might demonstrate their effectiveness in another conflict. The successful mass testing or use of biological weapons might produce a rapid "paradigm shift" in the perceived importance of such weapons and of Iraq's biological warfare programs;

- Iraq might break out of UN sanctions and reveal a more substantial capability than now seems likely. Paradoxically, such an Iraqi capability would help to legitimize Iran and Israel's nuclear, biological, and chemical programs and the escalation to the use of such weapons;

- Iraq might use such weapons through proxies or in covert attacks with some degree of plausible deniability. Terrorism and unconventional warfare would be far more intimidating if they made use of weapons of mass destruction.

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The Problem of Terrorism, Proxy, and Unconventional Warfare

The US is probably more vulnerable to Iranian or Iraqi diplomatic warfare than to any other challenge to US capabilities and the military edge provided by the "revolution in military affairs." It also, however, is vulnerable to a direct military challenge, however, through terrorism, proxy, and unconventional warfare. The bombings of in Saudi Arabia have already demonstrated this vulnerability and there may have been some degree of Iranian involvement. The bombings of the US embassies in Kenya and Tanzania in 1998 have also shown that targets can be chosen outside the immediate theater of confrontation.

Failed regimes create their own violent opposition through their mistreatment of minorities, repression, and economic failures. These pressures interact in the Gulf with the economic costs of war and revolution, and with a broad failure to offer Gulf youth the education, job opportunities, and social role necessary to fully integrate one of the world's youngest and most rapidly growing populations into its society. The "rentier," or welfare character, of Southern Gulf regimes and economies is rapidly becoming unaffordable, and Islamic extremism is often a natural refuge. These threats are likely to pose at least a low-level continuing threat to US and other Western power projection forces and other foreigners in the Gulf as the natural proxies for the regime. They would also be far more serious if they involved weapons of mass destruction.

Once again, there is no way to determine what Iran and Iraq will or will not plan in the future. Their official attitude toward terrorism is the usual one of denial, but this has scarcely proved to be the reality in the past. Further, Iran and Iraq's efforts may well be improvised and reactive -- suddenly escalating the scale of its use of unconventional warfare/terrorism in reaction to a given contingency or the failure of its military forces. This makes any effort to characterize their use of such delivery methods purely speculative -- whether in terms of warning against such threats or denying their existence.

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Developments in Southern Gulf Military Capabilities

In some ways, the challenge of coalition warfare is as important as preparing to meet Iranian and Iraqi threats. Chapter IV has shown that the US has important allies in the Gulf and needs the Southern Gulf states as coalition partners in virtually all contingencies. Unlike Iran and Iraq, the Southern Gulf states have also been the recipients of extensive arms transfers since the Gulf War. They have made massive purchases of arms since the Gulf War, many of which have consisted of first-line weapons and technology of the kind the US has exploited in its "revolution in military affairs."

The practical problem is each Southern Gulf state has acted largely on its own, often ignoring the need for standardization and interoperability, joint warfare, effective C4I systems and sustainment. There has been only a limit effort to achieve regional interoperability and battle management interoperability with the US. For example, Saudi Arabia remains the region's largest arms buyer, although Saudi Arabia's economic and budget deficit problems led to significant cuts in the rate of new arms orders in spite of the Gulf War. Saudi new arms agreements dropped from $45.7 billion during 1987-1990 to $2.2 billion in 1992-1995, and $7.1 billion in 1996-1999. Once again, the scale of these cuts in Saudi new orders has often been disguised in media reporting by the momentum of deliveries from past orders. Saudi arms deliveries totaled $26.3 billion during 1987-1990 and 31.3 billion in 1992-1995, and then leaped to $34.8 billion in 1996-1999 as deliveries caught up with the backlog of past orders.

Similar trends have affected the other Southern Gulf states. Kuwait, which ordered $6.1 billion worth of arms during 1992-1995, and only $1.1 billion during 1996-2000, but its deliveries rise from $3.3 billion in 1992-1995 to $4.3 billion in 1996-1999. Bahrain and Qatar also followed in Kuwait's pattern, although the UAE has emerged as a major sustained buyer. It ordered $7.3 billion worth of arms during 1992-1995, and $7.7 billion during 1994-1997. Most of these arms are still to be delivered; the UAE took delivery on $3.3 billion worth of arms in 1992-1995 and $4.5 billion in 1996-1999.

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The qualitative problems accompanying the arms purchases currently being made in the Southern Gulf have been described in Chapter IV. It is all too clear that far too many Southern Gulf countries buy arms without a consistent strategy, proper regard for coalition warfare, or meaningful mission priorities. A review of the land force purchases since 1991 reveal far too many types of different weapons from different countries both between Southern Gulf states, and often within their force structures. If one looks through both the naval order of battle in the Gulf, and the performance characteristics of the ships purchased since 1991, many naval purchases seem to reflect a contest as to which country can buy the most complex frigate or corvette.

The problems in air orders of battle and land-based air defenses are less obvious, but there are far too many types of aircraft and short-ranged air defense systems that are not integrated into a common and fully computerized southern-Gulf wide system or concept of air operations. Only Saudi Arabia has fully integrated airborne sensor and battle management systems into its concept of air operations. Purchases for offensive air operations reflect a lack of meaningful reconnaissance and targeting capabilities, a failure to integrate battle damage assessment into the loop, and a lack of integrated concepts of joint warfare.

This is not to say that individual countries have not made major progress in some areas, but the fact remains that the Southern Gulf is one of the major threats to the Southern Gulf. It is not coincidental that the last two USCENTCOM annual seminars dealing with security assistance have focused on the need to provide for adequate training, infrastructure, and sustainability, and interoperability. [404] They have stressed the fact that Southern Gulf states are buying too many major weapons too quickly and without a proper focus on key missions and warfighting capabilities. This scarcely means that Southern Gulf should cease all modernization or halt its efforts to obtain a technological edge over Iran and Iraq. It *should*, however, buy more slowly and focus on key missions and on adequate training, infrastructure, and sustainability, and interoperability. The Southern Gulf does not need a "revolution in military affairs" half as much as it needs a focused evolution in actual warfighting capability.

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Unfortunately, there is no unifying threat serious enough to catalyze collective action. Furthermore, each Gulf state still has a large backlog on undelivered arms orders which were placed with limited regard to mission priorities, interoperability, and collective defense. This backlog ensures that many problems will get worse over the next few years and not better.

It is also important to note that the Southern Gulf states are not the only option for regional strategic cooperation. The Bright Star series of exercises in Egypt involve massive combined exercises between US and Egyptian forces. The November 1995 series of exercises, for example, directly involved more than 5,000 troops, and included forces from Britain, France, and the UAE. The total forces involved in some form of training involved some 33,000 Egyptian troops and 22,000 US troops. The exercise phase involved 500 British troops, 500 French troops, and 200 from the UAE. It involved some 2,700 sorties by over 700 aircraft, and exercises by more than 100 tanks and a carrier battle group.[405] Egypt could play a major role in the Gulf in many contingencies if it had US support in the form of C^4I/BM capabilities, sustainability, and combat coordination. The annual exercises in 1996-200 have steadily refined these capabilities. The annual exercises in 1996-2000 have steadily refined these capabilities.

Iran and Iraq can never entirely ignore the capabilities of Israel -- particularly as advances in the peace process steadily cut the political liabilities that are likely to be triggered by Israeli intervention in a large-scale Gulf conflict. Further, Iran and Iraq must consider Israel's nuclear deterrent and the risks inherent in any Iranian and Iraqi action in the Gulf that threatened to expand to cover Israel.

Future Trends in the Gulf Military Balance

There are four major trends in regional stability and the regional military balance that seem like to shape the Gulf's reaction to the "revolution in military affairs" well into the 21st Century:

- The first is that the Gulf states have made little progress since the Gulf War in dealing with their structural economic problems and political divisions. Iraq, whose economy had largely collapsed during the Iran-Iraq War, experienced a full collapse in 1991. Its Sunni, Shi'ite, and Kurdish factions are held together by one of the most repressive regimes since Nazi Germany. Iran's per capita income has fallen to

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the levels Iran had in the mid-1970s, and it is unclear what Iran's long-term prospects for development will be. The Southern Gulf has talked reform, but has failed to act, and its rapid population growth has cut per capita incomes far below the days of the oil boom. Ethnic, political, and economic problems have already helped lead to extremism and violence in Bahrain and Saudi Arabia. If the Gulf states finally act on their promises of reform, there is no reason to assume their current problems will lead to significant civil unrest and violence. If they do not, internal civil conflict may become as serious a threat as Iran and Iraq.

- The second is that Gulf War has triggered a race in tactical technology, based in part on lessons drawn from the rapid US dominance of Iraq, and "revolution in military affairs." It is a race, however, that lacks consistency and cohesion. UN sanctions have limited Iraq's ability to purchase new weapons and advanced technology, and Iran has faced major constraints in terms of resources and access to imports of advanced weapons. Far too often, Southern Gulf nations have bought individual weapons with a high "glitter factor," without proper regard for training, sustainability, maneuver capability, and joint warfare. It has stressed the national competition for the most prestigious arms over any aspect of interoperability. Nevertheless, some Gulf forces are beginning to focus on the "revolution in military affairs" and on acquiring mission-oriented packages of advanced technology, rather than on building up force numbers to the degree they emphasized in the past.

- The third is that Gulf War has left a heritage of Southern Gulf dependence on US power projection capabilities. This dependence is reflected in strengthened US prepositioning, improved deployment facilities, and in a series of bilateral and multilateral training and exercise efforts that are far more advanced than those carried out as part of the Gulf Cooperation Council. This dependence, however, creates growing doubts within the Southern Gulf states as to the cost-effectiveness of national defense efforts and arms purchases. It makes the US a natural target for dissidents and extremists, and has the critical weakness that the US has not been able to preposition land equipment in Saudi Arabia -- the most urgent area in terms of Southern Gulf vulnerability.

- The fourth is that Gulf War and "dual containment" have slowed the missile race and efforts to acquire weapons of mass destruction. Instead, the Gulf seems locked into a process of "creeping proliferation" in which Iraq attempts to preserve the remnants of its pre-war capabilities, carry out new covert programs, and develop a "break out" capability for the time when UN sanctions are limited. Iran, in contrast, is actively pursuing the development and/or deployment of long range missiles. It is deploying chemical weapons and is carrying out covert biological and nuclear weapons programs, but at a slow and steady pace of development, rather than in the grandiose manner that Iraq pursued before the Gulf War. No Southern Gulf state has followed up Saudi Arabia's purchase of obsolete long-range missiles from China, or shown signs of developing weapons of mass destruction. Several countries are, however, beginning to explore theater missile defense and civil defense options. The US increasingly focuses on counterproliferation, and the "creeping proliferation" in the Gulf inevitably interacts with proliferation in the India-Pakistan arms race, the Arab-Israeli arms race, and the search to find a counterbalance to the conventional technology of the US.

Given these trends, it seems likely that neither Iran nor Iraq will pose direct near-term challenges to the capabilities of US forces. A combination of US, British, and Southern Gulf military forces should be capable of defeating virtually any war fighting threat from either state in the near-term if the US and Southern Gulf states act with sufficient speed, unity, and determination.

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The only near term developments that could rapidly alter this balance would be:

- A major cutback in US power projection capability or Southern Gulf support,
- The institutionalization of a significant low level internal conflict in a Southern Gulf state that Iran or Iraq could exploit and which would confront the US with the fact that it cannot save a Gulf government from its own people,
- Iranian or Iraqi acquisition of biological weapons of demonstrated lethalities approaching those of small nuclear weapons, and
- The sudden transfer of a nuclear weapon or sufficient fissile material for a "break out" in building a bomb -- a development that could radically change US and Southern Gulf perceptions of the risk in taking military action.

It should be clear from the preceding analysis, however, that Iran and Iraq clearly understand the potential gaps and weaknesses in the RMA, US, and coalition capabilities mean that the situation may be less favorable to the US and its allies in the mid-to-long term. Certainly, the US must look beyond over conventional military threats, and give high priority to dealing with proliferation, asymmetric warfare, diplomatic "warfare," and confrontations and wars of attrition and endurance. It is also almost axiomatic that Iran and Iraq will intensify their pursuit of these options in direct proportion to the extent that the US maintains or widens the "edge" that the "revolution in military affairs" now gives it in conventional warfighting capability. Furthermore, it is all too clear that US and other Western arms transfers have done little to create effective coalition partners, or to effectively integrate the "revolution in military affairs" into Southern Gulf forces. Instead, the RMA has encouraged Southern Gulf dependence on the US, if not military parasitism, and encouraged the tendency of Southern Gulf states to treat military technology as prestige oriented toys and pursue petty local rivalries in a climate of perceived security.

Implications for US Policy

The greatest single key to ensuring the stability of the military balance in the Gulf, and to maintain future peace, is to understand that the US must continue to play the role of the balancing power in region, and take the lead in ensuring any form of aggression will be checked. The US must also understand that its commitment to the Gulf may be as enduring as its

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commitment to NATO and involve a considerably higher risk of actual combat. US policy must be based on the understanding that US forces may have to remain in the Gulf for decades and probably with far less popularity than it had at the time of the Gulf War.

The US now has only one real military ally from outside the region – Britain – although Egypt, Israel, Jordan, and Turkey are allies that can play a major role on the periphery of the Gulf. It faces inevitable tensions with those in the Southern Gulf that see the US as some kind of "imperialist," those who oppose any kind of major Western presence for religious and cultural reasons, and those who oppose devoting resources to defense. The Gulf, however, is a vital US strategic interest, and not a popularity contest. As the previous chapters have shown, there is no credible military alternative to the US, and talk about purely Gulf security regimes is little more than gratuitous military nonsense.

The military role that the US must play is described in more detail in the following chapters. In brief, however, US policy must focus on the following steps:

- *Making a clear and unambiguous Presidential commitment to remain in the Gulf, defend our allies, and retaliate against any attacks upon them – including attacks with weapons of mass destruction.*

- *A strong forward US military presence and an ongoing engagement strategy that treats our Southern Gulf allies as true partners.*

- *Maintaining strong, combat ready US power projection capabilities*

- *Maintaining sanctions on Iraqi arms imports, and efforts to limit arms transfers and transfers of dual use technology to by Iran and Iraq.*

- *Building Serious Southern Gulf contingency capabilities*

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- *Correcting the present weaknesses in defending against a surprise, all out Iraqi land attack on Kuwait and the Saudi border.*

The first point in this list is one that needs careful attention from the next Administration. The US cannot afford strategic ambiguity in a region that needs both clear and decisive leadership and clear and decisive deterrence. The US needs to go beyond ad hoc statements and reactions to individual events and crises and announce a clearly defined national policy towards the Gulf that both our allies and enemies can clearly understand. This is a region where you need to set clear rules and enforce them both to reassure your allies and to place clearly defined limits on the actions of your enemies.

The new US President should announce a "Bush or Gore Doctrine" that defines both "containment plus replacement' and the overall US strategy in the Gulf. It should make it unambiguously clear that the US will remain in the Gulf, and will be prepared to support any Gulf state in resisting aggression, until a security structure can be established that includes all of the Gulf states and until it is clear that no Gulf state harbors any ambitions towards dominating its neighbors or acquiring its territory.

The new President should make a firm, long-term commitment to ensuring the security of the world's principal source of oil exports. He should make it clear that oil is a global commodity and that the US is committed to ensuring that oil is normally sold at free market prices, that oil exporters can invest in increased production, and that the flow of exports is stable and secure. In making such a statement, the President should state that oil is critical to the global economy and growing interdependence created by US trade with Asia. At the same time, the US should state that it is not trying to impose a unilateral approach to Gulf security and will seek a steady expansion of the role of its European, regional, and Asian allies in helping to ensure the security and stability of the Gulf.

The US should state that it will work closely with its Southern Gulf allies and partners to maintain the proper level of prepositioning and rapid deployment capability, and training for joint

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operations. At the same time, it should state its interest in reducing its active military presence in the Gulf to the minimum level necessary to ensure these strategic aims once states like Iran and Iraq demonstrate their peaceful character. It should also state that its long-term goal is to return to the largely "over-the-horizon" posture it had before the Iran-Iraq War if all friendly Gulf states are satisfied that a regional security structure has reduced the need for a US presence. At the same time, the US should declare that it is making a firm and lasting commitment to its Southern Gulf allies that it will stay in the Gulf regardless of any acts of terrorism, and that it will meet proliferation with strong counter-proliferation capabilities.

All of these steps should be supported by a coherent and patient campaign to inform the peoples of the region as to the reasons behind US actions. The US should use all available media, and work with its allies to obtain outside support and reinforcement. Declaring a policy once is pointless. A clear and formal doctrine requires a continuing dedicated effort.

The US should also follow-up the formal declaration of such a new doctrine with an active engagement effort and in-depth reports or "white papers" that respond to key Arab and allied concerns as they evolve. It should clearly describe the threats that the US is in the Gulf to counter. This reporting should outline US efforts to strengthen regional security capabilities by country, and it should make clear the fact that the US does not force arms on its allies or even dominate the arms trade in dealing with most states.

The US should make it clear that even the peak levels of US forces in the Gulf – now roughly 25,000 men and women -- are small relative to both the size of friendly military forces and the 700,000 men in Iranian and Iraqi forces, and that the permanent US presence in the Gulf is closely linked to cooperative security relations with its allies. Finally, the US should refute the charge that it is acting as a mercenary for the Southern Gulf states by showing that it places only a limited burden on its allies and that that it is making major efforts to improve their military capability. Above all, we need to recognize that Desert Fox is only a not particularly successful round in a complex battle of politics, force, and perceptions that we must do much more to win.

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VIII. US Military Planning, Conventional Forces, and Strategy in the Gulf

The US Department of the Defense has clearly described American objectives in the Gulf in its policy and posture statements for more than two decades. Secretary of Defense William S. Cohen describes the following US strategic goals in the broader Gulf region in his year 2000 Annual Report to the President and the Congress:[406]

> The United States seeks a Middle East and South Asia at peace, where access to strategic natural resources at stable prices is unhindered and free markets are expanding. The region cannot be stable until there is a just, lasting, and comprehensive peace between Arabs and Israelis and a peaceful resolution to Indian–Pakistani disputes. Stability also cannot be achieved until Iraq, Iran, and Libya abide by international norms and no longer threaten regional security. The Department, through the Cooperative Defense Initiative and various multilateral processes, is working actively with regional partners to address and deter the threat or use of chemical and biological weapons or long–range missiles by these states. DoD efforts will also concentrate on thwarting further proliferation of NBC technologies and successfully countering terrorism. The United States must continue working with regional allies and improving U.S. force capabilities to ensure that U.S.–led coalition forces have the ability to fight and win in an NBC environment. Stability in South Asia depends on improved relations between India and Pakistan, and a commitment from both countries to exercise restraint in their nuclear, missile, and chemical and biological weapons policies and practices

The US must deal with two major sets of challenges in meeting these goals and in improving its own forces to deal with contingencies in the Gulf. The first is to maintain to conventional capabilities it needs to deter or win conflicts in the Gulf. The second is to deal with the new threat of proliferation. The years since the Gulf War have seen considerable progress in many areas of US military capability in the Gulf region, but they have also seen a number of contradictory trends in US capabilities. US planners have been forced to make complex trade-offs, as they attempt to deal with the conflict between the "top down" goals set by the Clinton budget and the "bottom up" force goals established by US defense planners.

The cuts in US capabilities since the end of the Cold War do not necessarily reduce US capabilities for a single contingency like the Gulf, but they do mean some reduction in sustainability, in several key areas of modernization, and in the overall technological "edge" that the US had originally planned to maintain over potential threats in the region. The Clinton

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Administration and the Congress have been confronted by a series of "Hobson's choices." They have had to choose between cutting force strength, readiness, and modernization and so far have compromised by cutting all three.

Cuts in US Total Forces Since the Gulf War

The US no longer has anything like the total pool of forces it drew upon during the Gulf War. The US force cuts since the Cold War may represent a "peace dividend," but they also have an inevitable impact on US warfighting and power projection forces. The question is just how serious have these cuts been, and to what extend do they affect US warfighting capabilities.

Similar uncertainties affect the funding of current US forces and their readiness. Even if US force levels are adequate to meet a reduced threat, questions arise about how well they are funded, and particularly about the funding for modernization.

There are no magic answers, but the reporting of the Department of Defense, Congressional Budget Office, General Accounting Office, and Chiefs of Staff does indicate that there are major problems that the next Administration must address. They also indicate that any debates or political policy statements that ignore such problems are not correct.

Cuts and Plans as of the Mid-1990s

Table VIII-1 shows a history of the US build-down between FY1990 and FY2002. It is clear that, the US had 27% less active military manpower in the mid-1990s than it had the time of Desert Storm,, It had 30% fewer active Army divisions, 32% fewer battle force ships, and 36% fewer attack and fighter aircraft.

The Clinton Administration plan for the 1997 Quadrennial Defense Review (QDR) produced a 45% reduction in active Army divisions relative to Desert Storm, a 50% reduction in reserve component divisions, a 37% reduction in battle force ships, a 27% reduction in carriers, a 23% reduction in active carrier air wings, and a 50% reduction in reserve carrier air wings. They

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would also have produced a 46% cut in active Air Force fighter wings and a 42% cut in reserve wings.

In the case of the Army, the 1997 Quadrennial Defense Review (QDR) called for at least a 34% cut in tanks, a 41% cut in other active armored fighting vehicles, a 17% cut in major artillery weapons, a 25% cut in surface-to-air missile launch units, a 53% cut in short range air defense systems, and a 31% cut in tactical wheeled vehicles.

These cuts in equipment numbers raised serious questions about the credibility of a two major regional contingency strategy by the mid-1990's because the US Army had deployed roughly 76% of its inventory of many types of wheeled tactical vehicles during the Gulf War and had large numbers of commercial and Saudi wheeled vehicles as well.

Separate data provided by the Army staff also indicated that the Army was also to make a 41% cut in fixed wing aircraft, a 39% cut in active attack helicopters, a 31% cut in active medium lift helicopters, a 100% cut in active heavy lift helicopters, a 30% cut in active utility helicopters. If reserve aircraft are included, the Army will cut its total aircraft strength by 49%.[407]

The cuts in US Navy strength are more difficult to measure because of the number of different ship types, but the QDR called for the US Navy to cut about 30% of its active CGs and 78% of its CGNs, 100% of its FFs, and 34% of its FGGs. It was to eliminate 23% of its amphibious ships. It was to cut its active primary combat aircraft by 47%, its active ASW and patrol aircraft by 42%, and its active support aircraft by 42%. The US Marine Corps was to cut its active primary combat aircraft by 17%, and its active electronic warfare, observation, and refueling aircraft by 19%. It will have cut its reserve primary combat aircraft by 50%; its active electronic warfare, observation, and refueling aircraft by 19%; and its total reserve helicopters by 11%.[408]

The US Air Force was to cut its active bomber strength by 44%. It was to cut its active fighter/attack strength by 48% and its reserve strength by 48%. It was to cut the number of its

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active reconnaissance and special purpose aircraft by 48% and the number of its reserve aircraft by 96%. It was to increased its active special operations aircraft, but largely eliminate its reserve special operations aircraft. It was to reduce its number of active aircraft from 556 to 386, although its reserve aircraft were to increase slightly from 391 to 396. Figures are not available on the goal for tanker forces, but the number of active tankers had already been cut from 533 to 321, while the number of reserve tankers had been increased from 146 to 291.[409]

The data on FY2001 and FY2002 in Table VIII-1 shows that these cuts have been achieved or exceeded in virtually every area, with the exception of some categories of reserve forces. At the same time, it is important to keep them in perspective. The US no longer faces a major threat in Europe or a hostile Russia. China's military build-up is very slow and China is not a hostile power. North Korea has faced years of economic crisis, has had to slow its military build-up, and has only had limited modernization. Iraq has faced a decade of arms embargoes, and Iran's conventional arms imports have been much more limited than the US projected after the Gulf War.

As a result, it seems likely that the US retains enough forces to win any single major regional conflict. Its problems would arise only under the worst case for planning: two near-simultaneous major regional contingencies.

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Table VIII-1 – Part One

Evolving US Force Plans

Force Element QDR	Gulf War FY1990	Bush Base Force Plan	FY1995	FY1997	FY2001	Clinton 97 Goal for FY 2002
Strategic Forces						
Minuteman missiles	-	-	535	530	500	(500)
Peacekeeper missiles	-	-	50	50	50	(50)
B-52 bombers	(	(	74	56	56	(56)
B-1 bombers	268	176	60	60	82	(82)
B-2 bombers	)	)	6	10	16	(16)
Poseidon/Trident missiles	-	-	360	408	432	(432)
Army						
Active divisions	18	12	12	10	10	10
Active Separate Brigades	8	-	3	3	3	3
Reserve Divisions	-	8	8	8	8	8
Total Divisional and Separate Reserve brigades *	57	34	46	46	-	42
Active personnel (1,000s)	751	-	59	492	480	475-495
Reserve personnel (1,000s)	736	-	629	603	555	-
Marines						
Expeditionary Forces **	3	3	3	3		3
Active personnel (1,000s)	197	-	175	174	172	174
Reserve personnel (1,000s)	45	-	41	42	39.5	-
Active Divisions	3	3	3	3		3
Reserve Divisions	1	1	1	1		1
Active Combat Aircraft	368/24	-	320/23	308/21	280/21	280/21
Reserve Combat Aircraft	84/8	-	60/5	48/4	48/4	48/4
Navy						
Active personnel (1,000s)	583	-	435	396	371.3	394
Reserve personnel (1,000s)	149	-	101	95	90.0	-
Navy Aircraft Carriers	15/1	12/1	11/1	11/1	11/1	11/1
Carrier Air Wings	13/2	11/2	10/1	10/1		10/1
Active Combat Aircraft	662/57	-	528/44	456/36	432/36	432/36
Reserve Combat Aircraft	97/9	-	38/3	38/3	36/3	36/3
Battle Force Ships	546	430	372	354	316	(315)346
Support Forces Ships	66	-	37	26	25	25
Reserve Force Ships	31	-	19	18	15	15
Ballistic Missile Submarines	34	16	16	17	18	(18)
Mine Warfare & Coastal	-	-	13	19	24	(22)
Other	-	-	13	19	24	(22)

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Table VIII-1 – Part Two

Evolving US Force Plans

Air Force						
Active personnel (1,000s)	539	-	400	377	354	(375)
Reserve personnel (1,000s)	201	-	198	182	235	-
Fighter Forces						
Active Wing Equivalents	24	15	13	13		13
Active Combat Aircraft	1722/76	-	936/53	936/52	906/45	(906/45)
Reserve Wing Equivalents	12	11	8	7		7
Reserve Combat Aircraft	873/43	-	576/38	504/40	549/38	(549/38)
Conventional Bombers	33	-	0	0	36/16	(36/16)
Total Civilians (1,000s)	1,102	-	865	786	685	-
Strategic Lift						
Intertheater aircraft	400	-	364	345	304	(299)
C-5	-	-	199	163	88	(69)
C-141	-	-	199	163	88	(69)
KC-10	-	-	54	54	54	(54)
C-17	-	-	17	24	58	(72)
Intratheater aircraft	460	-	416	428	418	(418)
Active Sealift Ships						
Tankers	28	-	18	13	10	(10)
Cargo	40	-	51	48	57	(60)
Reserve Ships	96	-	77	87	86	(73)

* An approximate equivalent and numbers are not comparable in the outyears. The BUR plan calls for 15 enhanced readiness brigades, a goal that DoD will begin to reach in FY1996. Backing up this force will be an Army National Guard strategic reserve of eight divisions (24 brigades), two separate brigade equivalents, and a scout group.** A MEF includes a Marine division, air wing, and force service support group. Figures in parenthesis show the FY2001 force plan and not the QDR goal.
Source: William J. Perry, Annual Report to the President and the Congress, 1995, Department of Defense, Washington, February, 1995, pp. 274; William S. Cohen, Annual Report to the President and the Congress, 2000, Department of Defense, Washington, February, 2000, and material provided by the military services.

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Cuts and Plans as of 2000

The adequacy of current US defense budgets is a different issue. The Congressional Budget Office made a detailed comparison of current defense budget plans and the spending required to maintain current US force levels in September 2000. The CBO estimate of the recent and planned cuts in real US defense spending, and in US combat units since the Gulf War, Bottom Up Review, and Quadrennial Defense Review is shown in Table VIII-2. These force cut data track closely with the data show in Table VIII-1. Table VIII-2 shows CBO's estimate of the current trends in US defense spending.

The most interesting figures in the CBO study, however, are the CBO's estimate of the cost of maintaining the kind of force numbers shown in Tables VIII-1 and VIII-2 at suitable levels of modernization and readiness. These costs are shown in Table VIII-4, and it is clear that the US is falling far short of the expenditure levels it needs to properly fund even its present greatly reduced total force levels.[410]

The CBO estimate of the "sustaining budget" actually necessary to fund current forces defense totals about $340 billion in 2000 dollars. Thus amount represents the overall funding required to keep defense forces in a "steady state," which CBO says it calculated by holding constant certain factors, including the numbers of personnel, forces, and military bases. The CBO estimate covers budget function 050, which includes not only funding for the Department of Defense but also budget authority for defense activities related to atomic energy in the Department of Energy and for national defense functions in other federal agencies

The estimate of $340 billion is not an estimate of the required defense budget for any specific year, although CBO did organize the components of the estimate in traditional budget categories, but rather an estimate of the average annual expenditure required over time. More specifically, CBO's estimate of sustaining funding for the Department of Defense's portion of the defense budget includes funds to:

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- Keep increases in the pay of military personnel consistent with increases in pay in the private sector;
- Maintain current operating tempos (the pace of operations and training) and levels of maintenance and support for today's forces and keep increases in pay for DoD's civilian workforce in line with those in the private sector;
- Replace the military's weapons and equipment at a rate consistent with projections of their service lives—in particular, replace old weapons and equipment with new systems that exist or are planned, or with items in DoD's current inventory where no new system is in development;
- Provide funding for the research, development, test, and evaluation category consistent with the historical share of the budget that has been devoted to those activities; and
- Repair and replace the existing stock of military facilities and family housing units.

As Table VIII-4 shows, a total of $327 billion a year is required to fund the Department of Defense portion of our defense effort. This $327 billion compares with actual current funding of only $276 billion. About $13 billion more would support the defense programs in other agencies. Activities in the Department of Energy would account for $12 billion of these non-DoD funds, and the remaining $1 billion needs be dispersed among a variety of other agencies. Is these figures are added to the required Department of Defense funding, the total rises to $340 billion. This compares with total actual funding of $289 billion.

The Procurement and Modernization Crisis

The CBO indicates that increased defense spending is needed in a number of areas. These include $8 billion more a year for personnel, $5 billion for operations and maintenance, and $2 billion for research and development. The critical shortfall, however, is in procurement. The CBO estimate of the required procurement costs is $90 billion a year.

Tables Three and Four show that this is far higher than current actual funding, and the CBO notes that its estimate for procurement is conservative by the standards of the Gulf War. For example, the CBO makes the assumption the service lives of weapon systems and equipment. Should now be consistent with service-life projections that are much longer than those used in the past projections DoD is now keeping some equipment in service longer. If the CBO had based its procurement estimate on experience in retiring equipment as quickly as the US did at the time of

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the Gulf War, the CBO estimate of sustaining funding for procurement would be $25 billion higher.[411] This would create a total procurement budget requirement of $115 billion a year versus current funding of only $53 billion.

This lack of procurement funding is not new. The Joint Chiefs costed their procurement and modernization requirements at around $75 billion annually in the mid-1990s. They were only allowed to send requests of $60-$65 billion forward in their budget requests, however, and they got far less. As the 1997 Quadrennial Defense Review noted,[412]

> To modernize the force, the Department established a goal of increasing procurement funding to roughly $60 billion by FY 2001. The Chairman of the Joint Chiefs of Staff affirmed that goal during preparation and presentation to Congress of the last two defense budgets. Although we have made some reductions in the modernization program as a result of the QDR, $60 billion remains the rough level of procurement funding the Department believes is necessary to modernize even the slightly smaller force that will result from the QDR. On the path to that goal, the Department has established somewhat lower intermediate targets of $49 billion in FY 1999 and $54 billion in FY 2000. Continuing efforts to reduce the costs of the defense infrastructure will be needed to achieve those targets.

It is also a problem that will not ease with time. A GAO analysis of the FY2000 and FY2001 Future Years Defense Program notes that procurement spending over FY2001-FY2005 was actually slightly in the FY2001 request relative to the FY2000 request. These cuts are particularly striking in the outyears, when spending was supposed to rise. The FY2000 Future Years Defense Program called for $68.9 billion in procurement spending in FY2005. The FY2001 future years defense program calls for only $65.8 billion.[413]

The GAO analysis also shows that that spending in constant FY2001 dollars will be $60.3 billion in FY2001, $62.0 billion in FY2002, $64.4 billion in FY2003, $64.0 billion in FY2004, and $65.8 billion in FY2005. [414] If the Joint Chiefs' figure of $75 billion a year is right, this will create a total procurement deficit of $ 58.5 billion over the next five years. If the CBO estimate of $90 billion a year shown in Table VIII-4 is correct, the deficit will be $192 billion. This is a truly massive shortfall in modernization, and it will either require major additional funding or lead to massive cuts and stretch outs in the US defense procurement plan and seriously erode both the

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US qualitative edge and its ability to carry out anything approaching the revolution in military affairs.

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Table VIII-2

U.S. Military Forces in Selected Fiscal Years, 1989-1999

	1989	1993	1997	1999	Percentage Change, 1989-1999
Strategic Forces[a]					
Land-Based ICBMs	1,000	787	580	550	-45
Heavy Bombers[b]	310	194	126	143	-54
Submarine-Launched Ballistic Missiles	576	408	408	432	-25
Conventional Forces[c]					
Land Forces					
Army divisions[d]					
Active	18	14	10	10	-44
Reserve	10	8	8	8	-20
Marine Corps expeditionary forces[e]					
Active	3	3	3	3	0
Reserve	1	1	1	1	0
Naval Forces					
Battle force ships[f]	566	435	354	317	-44
Aircraft carriers					
Active	15	13	11	11	-27
Reserve	1	0	1	1	0
Navy carrier air wings					
Active	13	11	10	10	-23
Reserve	2	2	1	1	-50
Air Forces					
Tactical fighter wings					
Active	25	16	13	13	-48
Reserve	12	11	8	8	-33
Airlift aircraft					
Intertheater	401	382	345	331	-17
Intratheater	468	380	430	425	-9

SOURCE: Congressional Budget Office using data from the Department of Defense and the Office of Management and Budget, as shown in "Budgeting for Defense: Maintain Today's Forces," Washington, CBO, September 2000, cbo.gov.

Note: ICBMs = intercontinental ballistic missiles.

a. Forces with basically nuclear missions.

b. Includes some long-range bombers that do not have strategic missions.

c. Forces with largely nonnuclear missions.

d. Excludes separate brigades that are not part of a division.

e. A Marine expeditionary force includes a division, an air wing, and supporting forces for those combat elements.

f. Includes all Navy ships involved in combat—for example, ballistic missile submarines, surface combat ships, aircraft carriers, and amphibious craft—as well as some other vessels.

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Table VIII-3

Funding for National Defense and Personnel for the Department of Defense in Selected Fiscal Years, 1989-1999

	1989	1993	1997	1999	Percentage Change, 1989-1999
Budget Authority (In billions of 2000 dollars)					
Department of Defense					
Military personnel	109	93	78	73	-33
Operation and maintenance	116	99	99	109	-6
Procurement	97	58	44	52	-47
Research, development, test, and evaluation	47	42	38	39	-17
Military construction	7	5	6	6	-20
Family housing	4	4	4	4	-11
Subtotal	380	302	269	282	-26
Other Agencies[a]	11	16	13	14	23
Total, National Defense[b]	391	318	282	296	-24
DoD Personnel (In thousands)[c]					
Active Duty	2,130	1,705	1,439	1,386	-35
National Guard and Reserve	1,171	1,058	902	869	-26
Civilian	1,107	984	786	704	-36

SOURCE: Congressional Budget Office using data from the Department of Defense and the Office of Management and Budget, as shown in "Budgeting for Defense: Maintain Today's Forces," Washington, CBO, September 2000, cbo.gov.

NOTE: Apparent discrepancies in the calculations arise from rounding.

a. Covers defense activities related to atomic energy in the Department of Energy and national defense functions in other agencies.
b. Includes revolving and management funds, trust funds, and offsetting receipts. Excludes contract authority for the working capital funds because appropriations are used to liquidate that authority.
c. Strength measured at the end of the year.

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Table VIII-4
Fiscal Year 2000 Appropriations for National Defense and CBO's Estimate of a Sustaining Defense Budget, by Budget Category (In billions of 2000 dollars of budget authority)

	Appropriation for Fiscal Year 2000[a]	Sustaining-Budget Estimate[b]
Department of Defense (Budget subfunction 051)		
Military personnel	74	82
Operation and maintenance	102	107
Procurement	53	90
Research, development, test, and evaluation	38	40
Military construction	5	5
Family housing	4	4
Subtotal	276	327
Other Agencies (Budget subfunctions 053 and 054)[c]	13	13
Total, National Defense (Budget function 050)[d]	289	340

SOURCE: Congressional Budget Office.

NOTE: The figures in the table include both discretionary and mandatory funding. Apparent discrepancies in the calculations arise from rounding.

a. Based on CBO's estimates as of July 2000 but excluding supplemental appropriations of about $9 billion.
b. The sustaining-budget estimate is CBO's calculation of the annual funding required to maintain U.S. military forces at their current size; to modernize their weapons and equipment at a rate that is consistent with expected service lives and with maintaining a technological advantage over potential adversaries; and to maintain current funding for readiness. It is a steady-state concept and not an estimate of the defense budget for any specific year.
c. Covers defense activities related to atomic energy in the Department of Energy and national defense functions in other agencies.
d. Includes revolving and management funds, trust funds, and offsetting receipts, which total less than $0.5 billion. Excludes contract authority for the working capital funds because appropriations are used to liquidate that authority.

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The Problem of Readiness

As is the case with total force levels and defense spending, there is no way to translate the broad data on readiness into an assessment of US warfighting capabilities. It is also far from clear that Department of Defense reporting on readiness provides an accurate picture. While Department of Defense readiness reporting may sometimes overstate problems, it far more commonly overstates readiness capabilities.

Since 1995, the reports of Senator John McCain have revealed continuous problems in readiness that were not fully reported by the Department of Defense. Testimony before September 2000 hearings by the House Armed Services Committee also revealed a number of serious problems:[415]

- *Opening Statement of Chairman Spence:* The most recent Quarterly Readiness Report to Congress covering the period from April to June 2000 stated that, "unit readiness ratings indicated that the overall readiness of our forces is improving." As it has in the past, the Department of Defense reported that the risk in executing ongoing operations and responding to a major theater war is "moderate," while the risk for a second MTW is "high."

    - "…Admiral Jay Johnson, the Navy's Inspector General recently conducted an evaluation of Naval Aviation. His report – completed in April 2000 – found that funding for the Navy and Marine Corps' flying units had been "trimmed to the bone and beyond" to the point that "acceptable levels of risk have been exceeded". According to the report, this has resulted in "debilitating levels of frustration and morale crushing drudgery at the operational unit level." The Inspector General report found that 75 percent of those polled stated that the current situation negatively impacted their decision to stay in the Navy.

    - "…The Air Force is also experiencing readiness difficulties across the board. This past April, the Air Force experienced its lowest readiness levels in fifteen years, with only 67 percent of its combat units reporting C-1 or C-2, the highest readiness ratings. Although spare parts and personnel shortages continue, the Department's latest Quarterly Readiness Report noted that the Air Force is "beginning to arrest the declining trend in aircraft mission capable rates."

    - "…The Army's readiness problems also appear significant. Ammunition stocks are low and nearing exhaustion, according to the Army's testimony before the committee last week. In addition, an internal Army Training and Doctrine Command (TRADOC) report dated September 5th stated that the command's C-4 rating – the lowest readiness rating possible – was due to the fact that the "level of funding and personnel (military and civilian) do not support mission requirements."

    - "…Of particular concern is the fact that both the Army's Infantry School and Artillery School – two key combat training centers – reported C-4. Major General Stricklin, the Commander of the Artillery School, said that the Artillery School "is nearing an unready state for training artillery soldiers." In light of these

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comments, and similar comments made by the other thirty-one commanders in this report, I can only conclude that the Army's Training and Doctrine Command is in crisis.

- "…The Marine Corps has also called attention to equipment and readiness concerns. In August, the Marine Corps grounded nearly one-third of its aviation fleet because of a variety of maintenance problems. Last week, Lieutenant General William Nyland, Deputy Chief of Staff for Programs and Resources, testified before our Procurement subcommittee that aircraft mission capable rates have declined since 1995. Moreover, he stated, "Acceleration of the pace of modernization is absolutely essential to our readiness."

Overall Readiness

- *Statement of General Henry H. Shelton, USA, Chairman of the Joint Chiefs of Staff*: "Our review of overall force readiness indicates that forward deployed and "first-to-fight" forces remain capable of executing the National Military Strategy. But, as I have consistently testified, the risk associated with the most demanding scenario has increased over the past several years. Specifically, we continue to assess the risk factors associated with execution of the 1st MTW as moderate and for the 2nd MTW as high.

  - "This does not mean that U.S. forces would not prevail in either contingency. What it does mean is that it would take us longer to respond to hostilities. In turn, this can mean territory lost and the potential for a longer fight with increased casualties.

  - "This risk assessment for the 2-MTW scenario is based on many factors, including both traditional readiness issues voiced by the Services, and joint readiness issues reported by the Commanders in Chief (CINCs).

  - "As the HASC well knows, the Services have reported declining readiness indicators in areas such as manning, training, and equipment readiness for several years, although not all Services have experienced problems to the same extent. While the readiness deficiencies are most visible in the later deploying and non-deploying forces, some forward deployed and "first-to-fight" forces -- *though ready* -- have also experienced some of these difficulties. The Services have taken active measures to address these deficiencies and we are now seeing evidence that those efforts, in conjunction with the much-needed funding increases in the FY 1999 and FY 2000 budgets, have arrested the declines in most cases.

  - "In addition, two other areas of concern must be recognized. First, while our materiel is ready for combat operations, our long-term ability to sustain that equipment is slipping. One cause is due to the negative effects of a higher than planned tempo of operations on our aging equipment. This high tempo and the associated wear-and-tear require more frequent maintenance and repair, further highlighting the need for recapitalization and modernization of our forces. Moreover, we have not been able to procure enough new equipment to reduce the average age of our force structure. It is also important to note that we believe this higher maintenance tempo has also had a deleterious effect on the hardworking troops attempting to maintain this aging equipment, which directly impacts retention of our quality force.

  - "Second, while the focus on current readiness issues is necessary and has produced positive results, those results have come at the expense of our ability to provide resources for maintaining infrastructure. The Services will continue their efforts to balance resources to meet the competing demands of personnel, current readiness, and infrastructure. However, continuing to improve our current readiness posture to desired levels while preparing for tomorrow's challenges will require additional resources. Some of the required resources may be derived from additional Base Realignment and Closure rounds.

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- "…Our latest Quarterly Readiness Report submitted to Congress also highlighted the "joint readiness" concerns of the CINCs regarding their ability to synchronize and utilize forces to meet theater and national objectives. These concerns generally reflect *capability* deficiencies that highlight shortages of specific types or quantities of systems or the need for additional personnel billets, as opposed to traditional readiness issues that are managed by the Services.

- "…The report emphasized eight areas of strategic concern: command, control, communications and computer (C4) deficiencies; intelligence, surveillance and reconnaissance (ISR) deficiencies; mobility shortfalls; logistics/sustainment shortfalls; terrorist and weapons of mass destruction (WMD) challenges; information vulnerabilities; stresses on the force from ongoing contingency operations; and the ability to disengage quickly from ongoing operations to meet timelines for a 2-MTW scenario.

US Army Readiness

- *Statement by General Eric K. Shinseki, Chief of Staff, US Army:* We…undertook last year to redefine the priorities whereby we fill our organizations with manpower. We began filling our warfighting units first; that is, we increased the percentage of personnel fill in our divisions and combat arms regiments. This priority necessarily entailed accepting risk in other areas, non-divisional units, higher-level headquarters, and the institutional Army. As a result, our early deployers are more ready than they were at this time last year. Predictably, we have felt some pain in those units from which we reassigned soldiers.

    - "…The Army is too small to accomplish all of the missions that we are called upon to perform. We realigned our personnel priorities to test that hypothesis. We do not yet have all the requisite data to make a formal request for a change in endstrength, but I expect to receive reports in the near future that will enable us to conduct a manpower analysis. At that point, we will return to you with recommendations about the size of The Army of the future.

    - "… The Army is globally engaged, heavily committed to meeting the daily requirements of the National Security Strategy (NSS) and National Military Strategy (NMS). On any given day, more than 140,000 Army personnel are forward stationed or deployed around the world. Soldiers and civilians stationed in the United States perform other critical roles, from keeping warfighting organizations ready for worldwide employment today to building the tools necessary to maintain readiness tomorrow.

    - "…Since 1989, the Army has participated in 35 major deployments, many of which are small-scale contingencies in support of our national security interests. In nearly all these deployments, the Army provided the bulk of our nation's deployed forces, and therefore, contributed to shaping the operational environment in major ways. During the same period, we reduced the size of our Army-Active, National Guard, and Army Reserve-by over 34 percent, a reduction that came in response to the end of the Cold War.

    - "…The Army has remained ready at all times to meet the warfighting requirements of the NMS: to fight and win two nearly simultaneous major theater wars (MTWs). We are still able to meet the requirements of the NMS, but there is moderate risk associated with fighting the first MTW and higher levels of risk associated with the second MTW. In this context, risk does not mean that U.S. Forces would not prevail; rather, it means that achieving our objectives would likely require a larger expenditure of our national treasure.

    - "…the increased frequency of mission requirements has had detrimental impacts on the force, especially in terms of operational tempo, personnel tempo, and turbulence. Current Army endstrength does not

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permit us to fully meet all our manning requirements. Meeting our recruiting, retention, and attrition objectives has helped, but not enough to meet all requirements we have. Last year,.

- "… readiness in our active divisions has improved, even though our deployment tempo continues to increase. We will man our active divisions and armored cavalry regiments at 100 percent of pay grade and skill requirements by the end of this fiscal year. We will similarly man early deploying units to 100 percent in FY01. We will fill all remaining operational units in the active force in FY02. Other units with approved authorizations will follow in FY03. The Army's manning strategy is to fill all active units at 100 percent by grade and skill by the end of FY03.

- "…the U.S. Army Training and Doctrine Command's (TRADOC) mission priority is accessing new personnel, training, and leader development. TRADOC is achieving its mission, but its level of personnel fill (both military and civilian) does not fully support mission requirements…The Army Materiel Command and other parts of the institutional Army are experiencing similar challenges.

- "…The increased readiness of our divisions does not address the readiness of the whole Army. Increasing mission requirements have resulted in increasing employment of our reserve components, particularly our National Guard divisions. The best and most recent example is the Texas Army National Guard's 49th Armored Division deployment to Bosnia as the command element of Task Force Eagle. Of course, the increasing frequency and duration of deployment presents challenges to our National Guard and Army Reserve units, employers, soldiers, and families.

- "…The Army has a plan to provide additional full-time manning to the National Guard. We have engaged in a constructive dialogue with the Guard, the Reserve, and employer support groups to address concerns ranging from medical care and insurance to family support groups. Two weeks ago, we announced the alignment of all National Guard divisions with active duty corps for training oversight and mission focus. This missioning initiative builds on the success of division teaming and will push forward the full integration of the active and reserve components of The Army.

- "…The Army has fully funded operating tempo (OPTEMPO) requirements in accordance with defense planners. But readiness is more than OPTEMPO. We have training shortfalls in institutional training, training support, training range modernization, and combat training center modernization. Our depot maintenance program received a plus-up to achieve funding at 65 percent of requirement. Base operations support, which underpins training readiness, is funded at 91 percent of requirement. Real property maintenance is currently funded at 75 percent of requirement, a funding level that will not slow or prevent the ongoing deterioration of existing Army facilities.

- "…Old means of measuring our readiness can lead to reporting anomalies. For example, last fall two Army Divisions reported a C-4 rating for personnel because parts of their formations were conducting operations in the Balkans and were therefore unavailable for a wartime mission. Those divisions were clearly trained and ready, as evidenced by the fact that they were conducting military operations at the time. We will soon announce new readiness standards that will take into account such contingencies and thereby help us better to answer the question-ready for what?

- "…Over the past year, we have made significant progress in sustaining and recapitalizing the Legacy Force, establishing the Interim Force, and beginning the all-important science and technology (S&T) effort for the Objective Force. We have established the first Interim Brigade Combat Teams at Fort Lewis, Washington. The organizations are in place and are fielding surrogate equipment in lieu of the yet-to-be-selected Interim Armored Vehicle (IAV). That IAV selection process is well under way, and we anticipate making an announcement within the next several weeks. We will then go forward with an

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Initial Operational Test and Evaluation. The S&T effort is the linchpin of the Transformation. Defense Advanced Research Projects Agency and the Army Science Board have begun this enterprise in earnest and their efforts are showing promise. However, we need greater resources to accelerate their research, enabling us to achieve better scientific and technological results sooner.

US Navy Readiness

- *Statement of Admiral Vern Clark, US Navy Chief of Naval Operations:* Our forward deployed forces today are ready to respond to all tasking. However, there is increasing concern that this high level of readiness is coming at the cost of our non-deployed forces. It is the readiness of these forces that continues to be of concern as we attempt to maintain the balance between current and future readiness.

  - "… we have met our recruiting goal for the past two years. „,Retention is at the heart of our efforts to achieve and sustain optimum personnel readiness. One of our greatest challenges is to improve enlisted and officer retention. Our retention effort this year has enabled us to reduce recruiting goals for FY00 and FY01. Although progress has been made in officer and enlisted retention, we are still below the steady state goals required to maintain our force structure.

  - "…Some attrition is inevitable; however, the current level is too high.

  - "…One-third of our Fleet is deployed on average every day, and our Navy is ensuring that deployed readiness remains high. We know too that non-deployed readiness bears the brunt of supporting our forward deployed presence. We have seen some improvement in the last three years in reducing shortfalls, but the limited availability of support material for our non-deployed units continues to be a significant readiness challenge…additional resources are required to ensure non-deployed readiness is funded at sufficient levels.

  - "…our funding reflects the increasing operational costs associated with our aging aircraft (the Navy's aviation force is now the oldest it has ever been in its history). …The same holds true for aircraft depot maintenance, which ensures that engine and airframe maintenance is sufficient to meet fleet requirements for available aircraft and spare engines. Until we have achieved a modernized force, we will continue to face the challenge of the increasing costs to maintain the existing, aging force. These shortfalls in maintenance, spare parts and support equipment are impacting our training readiness among non-deployed forces, particularly in our aviation community.…For ships, as with our aircraft, the reduction of the force structure through the decade of the 90's, coupled with OPTEMPO of the 90's, has significantly increased the utilization rate of the existing force. This increase in utilization is accelerating aging and resulting in higher costs of operation.

  - "…I am concerned about the inventory levels of Precision Guided Munitions…we are still below the current warfighting requirement. The shortfall of precision munitions is a major risk driver for our forces in a second MTW scenario. With our current inventory, execution of a second MTW will rely more on the use of non-precision munitions, thereby increasing the risk to our pilots and the potential for collateral damage.

  - "…The use of live ordnance, for example, is a vital means of training our forces in combined arms operations. The inability to conduct coordinated live fires exercises from ships and strike aircraft is particularly detrimental, given that our carrier battle groups continue to engage in combat operations soon after arrival in theater. Our ability to train jointly, especially with the Marine Corps, is also being affected

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by the lack of live fire capability for the Atlantic Fleet Forces. Our troops should get their first experience with live arms before actual combat.

- "…Our Fleet has gotten smaller, and the number of ships we deploy with each battle group has decreased. During this downsizing, demand for deployed battle groups and amphibious ready groups have remained steady at a minimum and in some cases have increased. Nonetheless, a carrier battle group routinely deploys today with fewer surface combatants than 10 years ago. Theater commanders have fewer assets to cover commitments, and must time-share assets among theater commanders, often leaving gaps in coverage. Fewer assets mean more underway time per unit. Increased utilization results in additional wear and tear on our ships and aircraft, requiring more maintenance. It is critical that we begin to fund 100% of our manning, maintenance, ordnance, modernization, recapitalization and training requirements.

- "…Current DoD plans require an 8-10 ship per year build rate to sustain a QDR force. The actual numbers of ships in our plan is not sufficient to meet this need. The steady erosion of the service life of our platforms and equipment and lack of a viable recoup plan will eventually lead to a point where we will be unable to sustain our operational commitments.

- "…The administration's FY 2000 Budget provided for an increase to base pay, restoration of the 50% retirement option, pay table reform, and special pays and bonuses, all of which are having a positive impact. These first steps will be key towards addressing our recruiting and retention challenges.

- ". Improving the quality of our workspaces requires a commitment to both Real Property Maintenance and MILCON, both of which are underfunded.

US Air Force Readiness

- *General Michael E. Ryan, Chief of Staff, U.S. Air Force:* Air Force units are the early responders in major theater war scenarios and in day-to-day operations throughout the globe. In this last year following the victory in Kosovo we maintained our involvement in the full spectrum of operations: keeping the peace in the Balkans, enforcing UN sanctions in Southwest Asia, responding to humanitarian crises, promoting worldwide mil-to-mil contacts, and engaging in counternarcotics support operations. To meet this kind of optempo we implemented our AEF scheduling one year ago. I believe it has been very successful in providing the CINCs trained-to-task forces while putting stability and predictability into the lives of our people.

  - "…Air Force readiness has not turned around—at best these efforts have leveled off the decline. …The overall combat readiness of our combat units is down 23% since 1996. Because we must assure the readiness of our engaged forces overseas, we have done it at the expense of our stateside units. The reasons for these readiness declines have their basis in operations tempo, past underfunding of spares, dealing with older and aging systems, and a workforce that is less experienced because of retention declines.

  - **"..**Our operations tempo remains high. Our people are still deploying over 3 times more often with a force 60% its former size. A brief overview outlines the kind of constant activity in which Air Force people are engaged. America's airmen are supporting Balkan air operations as part of the peacekeeping team providing stability there. In the past two years we've flown over 31,000 sorties, providing the top cover for NATO, in peace efforts in this fragile region of the world. In Southwest Asia, on almost a daily basis, our aircrews are fired upon and respond with force to police the no fly zones in northern and southern Iraq. Many are back in the desert for their fourth or fifth rotation, often in austere conditions.

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When floodwaters devastated the people of Mozambique and South Africa, Air Force people were there to respond. In that international effort, Airmen and aircraft provided relief distribution, aerial assessment of damage and water levels, and critical search and rescue. We also responded to humanitarian needs following floods in Venezuela and Vietnam, and a volcanic eruption in the Philippines.

- "…The level of peacetime spares is key to Air Force support of the ongoing day-to-day demands and surges in crisis and conflict. Additional funding we've received from the Administration and Congress in the past two years has been very helpful in putting parts on the shelves. Using these increases, we've been able to reduce backorders (the empty bins) in our supply system by half.

- **"…**The additional spares on the shelves help significantly. There is much left to do. A lack of parts permeates several aspects of readiness: mission capable rates, cannibalization rates, and added work-hours for our people who try to meet mission demands without the equipment that they need. ..The Mission Capable (MC) rates of our aircraft have continued to decline by over 10% since 1991. Mission Capable rates are directly proportional to how much time an aircraft is not available because of not having parts in supply (TNMCS) or because maintenance work needs to be done on the aircraft to make it ready (NMCM).

- "…one of the primary reasons is the average age of our current aircraft fleet. It is now almost 22 years old. The older the aircraft the more difficult and expensive it is to maintain. And even if we execute what is in our current fiscally constrained programs the aircraft age of a USAF aircraft will reach almost 30 years old in the next 15 years. That is why it is so important to continue the force modernization with needed capabilities such as airlift and trainers and revolutionary combat capability such as the F-22.

- "…Recruiting and retention of our enlisted force are key factors in the readiness equation. Although we recruited more airmen in 1999 than 1998, 1999 was the first year that we did not meet our recruiting goal—a goal which we had raised in order to make up for our losses. …we've met our active duty recruiting goal for FY 2000. .

- "…During the last several years, the overall retention rate remains a serious concern. We fell below our end strength authorization of 361,000 active duty members by 5,300 people. Enlisted retention levels are below goal for our first term, second term, and career airmen, and are the principal contributors to this shortfall. There are indications that the retention declines are leveling off but we are still below our retention goals. Officer retention is below our desired levels in both pilots and mission support. The negative retention trend exacerbates the high operations tempo problem because it places a greater burden on those who continue to serve.

- "…a shortage of 1200 pilots exists today, the additional bonuses have made an impact. Our projections show that we should be able to cut our pilot shortfall almost in half over the next five years through increased retention and production.

- "…In September of 1998 I stated the following: "Because of funding shortfalls, we have significantly under-invested in our base operating support, real property maintenance, family housing, and military construction. We cannot continue to mortgage this area of our force readiness without significant long-term effects." That has not changed and remains true today. We are mortgaging the infrastructure aspect of our force readiness to stem the decline in operational readiness. Over the past six years we have averaged an investment in infrastructure at a 250-year replacement rate. Industry standard is 50 years. We have a $4.3 billion real property maintenance backlog. Our houses average 36 years of age. We can only afford to renovate a small percentage of these houses each year out of the almost 110,000 houses we

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maintain. While there is a need for another round of BRAC, we cannot continue this under-investment or it will have a compounding effect on our near term and long term readiness.

- **"….**We remain concerned about the continued downturn in near term readiness outlined in this and previous statements. Readiness remains a struggle we must win. But of equal concern is our long-term readiness. That will in large measure be driven by our ability to recapitalize our aging force structure. As we enter this next millennium, prudence dictates that we fund the recapitalization of the force structure for the tasks the Air Force is being asked to perform in the 21st century. As I said in 1998 testimony, "We need substantial and sustained funding" to continue to provide the full spectrum aerospace power our nation expects." That has not changed.

US Marine Corps Readiness

- *Statement of General James L. Jones, United States Marine Corps, Commandant of the Marine Corps*: Today's Marine Corps is healthy and remains central to the Nation's efforts to promote and protect its many interests. There are currently 172,500 Marines on active duty. Of that total, over 114,000 are in the operating forces and nearly 30,500 are forward deployed, forward based, forward stationed, or deployed for training around the world. Key to our Total Force are the 39,000 men and women of the Marine Corps Reserve…This past year we reestablished the middle tier of our expeditionary warfighting capability, the Marine Expeditionary Brigades, to augment the smaller Marine Expeditionary Unit and to enhance the larger Marine Expeditionary Force.

- "…Though the last Quadrennial Defense Review led to tangible improvements, it also resulted in a reduction in our end strength that essentially removed the warfighting "shock absorber" of the Marine Corps. As a result there remains little flexibility in meeting the personnel demands inherent in a robust operational tempo. The dramatic increases in operational requirements coupled with topline constraints over the last several years, have mandated a very reduced rate of modernization. We are, in essence, continuing to maintain our current status at the expense of future readiness. We are at a point where failure to rectify modernization shortfalls can no longer be ignored.

- "… For the last eight years of the 1990s, the Marine Corps' ground equipment funding was well below the "steady state" requirement of $1.2 billion…this extended period of underfunding has resulted in a recovery rate requirement of $1.8 billion per year that we do not reach in the Future Year Defense Plan. The longer recovery is deferred, the longer we must maintain aging legacy systems and confront the risks associated with them.

- "…While we have a viable, balanced plan to field new and improved aviation platforms (MV-22, JSF, KC-130J, AH-1Z/UH-1Y), the pace at which we will do so is critical. We are currently funded at approximately $0.5 billion below our historical steady state funding for aircraft procurement. Similar to the under financing of our ground equipment, this has left us with a recovery level of $2.4 billion. Funding at that level would both accelerate our pace of modernization by moving forward our full fielding of these systems and shorten the period of increased expense for sustainment of our legacy airframes.

- "It is readily apparent that we are fast running out of short-term fixes for budget shortfalls. One-time increases in defense spending are not the solution. A sustained period of increased funding is required in order to ensure the future readiness of your Corps.

- **"…**The primary equipment and weapons systems in our ground combat element are aging and reaching their programmed service life all at the same time…We have taken maximum advantage of Service Life

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Extension Programs, which enable us to marginally improve our legacy systems but cannot fulfill our modernization needs. Our reliance on aging equipment negatively impacts our capabilities in many ways: the buildup of combat power ashore is slowed and more predictable, our ability to conduct in-stride breaching of mines and obstacles is limited, and our single artillery piece lacks sufficient range to provide essential fire support to maneuver elements.

- "…Additionally, the countless hours of maintenance on our aging ground systems directly impacts the quality of life of our Marines. The replacement of the 17,000-vehicle fleet of HMMWVs with the HMMWV A-2 is a crucial step in our efforts to modernize our ground mobility. Acquisition of major replacement systems such as the Advanced Amphibious Assault Vehicle (AAAV), the High Mobility Artillery Rocket System (HIMARS), and the lightweight 155mm howitzer is only part of the solution; work still remains to be done to identify successors for much of our aging equipment to include individual and crew-served weapons such as the replacement of nearly 1,800 squad automatic weapons in our infantry battalions this year. Lethality and the ability to maneuver our forces remain cornerstone requirements for the ground combat element.

- **"…**Many of our aircraft are approaching block obsolescence. In fact, the majority of our primary rotary-wing airframes are over twenty-five years old. Figure 4 reveals that the majority of our key aviation equipment is older than the Marines who use it. When our first KC-130F rolled off the assembly line, President Kennedy was beginning his first year as the Commander-in-Chief, thus underscoring the importance of the KC-130J. Similarly our CH-46E, an off the shelf platform, averages over thirty years old 3 4 some of our younger pilots are flying the exact same aircraft that their fathers flew. While we are now receiving the MV-22, their rate of production and delivery is neither economical nor efficient, and thus prolongs the retirement of the CH-46E. The Short Take Off Vertical Landing Joint Strike Fighter, the replacement for our F/A-18C/D Hornets and AV-8B Harriers, is scheduled to begin delivery in 2008 with an initial operational capability in 2010 3 4 we must hold the line on this.

- "…While the recent grounding of four different types of aircraft was primarily a flight safety issue, increasing maintenance challenges do influence our level of readiness. Since 1995, the direct maintenance man-hours per hour of flight increased by 33% and there has been a 58% increase in our "cannibalization" rate. During the same time period the full mission capable rate, though still within acceptable parameters, has decreased by 9.4% across the force. These statistics represent data for all Marine Corps aircraft and show a declining level of readiness.

- "… the equipment used in our combat service support element is also aging similar to that of the other elements of the Marine Air Ground Task Force. Despite the importance of combat service support to the flexibility and responsiveness of our forces, we continue to rely on aged vehicles, trucks, and materiel handling equipment that should be replaced. Acquisition of the Medium Tactical Vehicle Replacement (MTVR), a cost-effective replacement for our existing tactical trucks, and the Hercules M88A-2 Recovery Vehicle, a successor to our tank retriever, are crucial steps in our efforts to modernize. We recognize that new vehicles and equipment will not materially improve our combat service capabilities without attendant improvements in doctrine, organization, and processes. Consequently, we have developed a pioneering Integrated Logistics Concept to underwrite our combat service support capability.

- "…While making progress in the replacement of family units, we continue to have a deficit of approximately 10,000 units. Our Backlog of Maintenance and Repair has been arrested, but it still amounts to over $600 million. Although this is a reduction from last October, it is not close to our intended goal of $100 million by Fiscal Year 2010.

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- As you know, restoration of our deteriorating infrastructure is not limited to reducing our Backlog of Maintenance and Repair, but includes Military Construction (MILCON) as well. Budget limitations force us to make hard choices that result in funding only our most critical construction requirements. Although we have reduced our MILCON replacement cycle to approximately 100 years, it is still twice the industry standard.

- "…In the very near future, our Marines will benefit from the revolutionary MV-22 Osprey tilt-rotor aircraft and the Advanced Amphibious Assault Vehicle (AAAV). Along with the Landing Craft, Air Cushion (LCAC), the MV-22 and AAAV will allow the realization of the capabilities required for future Marine Air Ground Task Force operations. We are also prepared to further the capabilities of our ground combat element by fielding a new generation of modern ground equipment to include the High Mobility Artillery Rocket System and the lightweight 155mm howitzer. With your support, our aviation combat element will receive the Short Take Off Vertical Landing version of the Joint Strike Fighter 3 4 a truly joint weapons system that can be operated from expeditionary airfields, amphibious ships, and aircraft carriers. Furthermore, we are ready to improve our combat service support element with systems like the Medium Tactical Vehicle Replacement and Hercules Recovery Vehicle.

- "Fully exploiting the tremendous potential of equipment modernization and improvements to infrastructure will hinge, in part, on the achievement of a proper level of amphibious lift. Our amphibious lift requirement is well defined. The Department of the Navy Lift Study and Mobility Requirements Studies recognize a 3.0 Marine Expeditionary Brigade (MEB) equivalent amphibious lift capability as necessary to allow us to satisfy all forward presence requirements while maintaining the flexibility to deal with the unexpected. The 2001-2006 Defense Planning Guidance establishes a fiscally constrained amphibious force to support 2.5 MEB equivalents, equating to 12 Amphibious Ready Groups with a total of 36 ships (twelve big deck LHDs and LHAs, twelve LSD 41/49s, and soon with your help, twelve LPD-17s).

- "…Our ascendancy to superpower status 3 4 militarily, culturally, technologically, diplomatically, and economically 3 4during the 20th century is due, in no small part, to the valiant accomplishments of those who wore the Nation's uniforms during the emergence of our national identity. ..In essence, a sustained investment in national security is an investment to insure our way of life. It directly contributes to stability, the spread of democracy, growth of the world economy, and achievement of our multiple national security objectives. It is also, fundamentally, an insurance investment that must be made today to be effective tomorrow. Prudent people invest in insurance to offset the uncertainty of the future; long before a need arises that requires the insurer to indemnify. Similarly, we must not "under insure" our national security. Future contingencies will likely not permit time to overcome the consequences of miscalculation.

- …(There is) an approximately $1.5 billion requirement for unfunded priorities for your Marine Corps. These unfunded priorities addressed critical elements across the Corps: ground equipment, aviation modernization, and infrastructure support. The Congress was instrumental in financing some of these shortfalls. While our future projections clearly indicate improving trends, my concern remains the pace at which we modernize. In assessing the list of unfunded priorities that I provided to the Congress this past spring, I believe that $1.5 billion still accurately portrays our highest priority unfunded requirements.

In short, the Chiefs of the US military services have all made it clear that the US has serious near, mid, and long-term readiness problems that need to be addressed. Many would be most serious if the US faced two major regional contingencies, but some would affect all serious

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US operations in the Gulf. While the US may remain the "world's only super power," it clearly is not paying enough to keep this status, and is scarcely as "super" as it was at the time of the Gulf War.

The Problem of Contingency Funding

This is a point that is made all too clear in other ways by the General Accounting Office. The Department of Defense estimated that that cost of its ongoing contingency operations would be some $4.7 billion in FY2000, and that the US interventions in the Gulf and Balkans would account for 99% of the total. The costs for the Gulf (Southwest Asia) included $138.0 million in incremental personnel costs and $913.3 in operation and maintenance. The costs for the Balkans included $406.1 million in incremental personnel costs and $3222.3 in operation and maintenance. Another $25 million in operation and maintenance costs was budgeted for East Timor. The GAO found the incremental costs for all Gulf operations from 1992 through March 2000, totaled $7.44 billion and the cost of the Balkans totaled $13.82 billion.[416]

The Congress has voted adequate supplementals to cover the main costs of these contingency operations since FY2000. During the previous seven years, large amounts of these costs had to come out of training and readiness funds, and for legalistic reasons the services are not allowed to recoup most costs on areas like infrastructure. [417] The expenditures for rehearsals and dedicated mission training for actual contingency operations are also counted as if they were general force-wide training expenditures. More important, no allowance is made in the incremental contingency costs for any aspect of procurement, although they incur massive amounts of wear and shorten equipment life. [418]

The Problem of Total Defense Spending

This analysis makes no attempt to analyze the defense plans advanced by either party. It concentrates solely on the adequacy of the existing defense program. It is clear, however, that much will have to be done over the next Administration to fix a defense structure that is badly underfunded.

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To put the required costs or force cuts in perspective, the CBO estimates in Table Four that the US should be spending $327 billion a year on the Department of Defense portion of defense activities to properly fund the current force structure – if the US, as the world's only superpower, does not become involved in any major new contingency for the next five years. The US currently budgets $292.3 billion in FY2001, $289.6 billion in FY2002, $289.2 billion in FY2003, $289.1 billion in FY2004, and $289.7 billion in FY2005. This is a total of $1,450.0 billion in constant FY2001 dollars. The CBO estimate would mean that the US actually needs $1,635.0 billion. The shortfall for Department of Defense portion of defense activities over the entire future year peiod is close to $200 billion, or some $40 billion a year.

Put differently, the CBO estimates that that DoD would need to cut its current forces by roughly an additional 25 percent in order to reduce its total sustaining budget to $290 billion (the defense appropriation for 2000, excluding supplemental funding). That kind of reduction would mean cutting more than two more divisions in the active Army, three more carrier battle groups in the Navy, and the equivalent of more than three active fighter wings in the Air Force.

Such cuts are smaller than the reductions in forces that have already occurred since the end of the Gulf War.. Nevertheless, they would have a major effect on the capability of U.S. forces because the cuts would be taken from today's smaller military. It is fairly clear from such estimates that the US is not maintaining its existing forces at anything like the overall level of capability they had at the time of the Gulf War, and that the US does not have the capability to fight two near-simultaneous major regional contingencies.[419]

US Power Projection Capabilities and Strategic Warning

Capabilities are always more important than strategy and doctrine. The latter are the almost inevitable causalities of history. The former can actually fight. Nevertheless, strategy and doctrine have their place. While the Quadrennial Defense Review that was conducted in 1997 did not describe US warfighting strategy in the Gulf in detail, it did discuss overall US strategy in major theater wars in some depth, and it is clear that the US remains formally committed to both

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maintaining major power projection forces and to being able to fight two near-simultaneous theater conflicts:[420]

> At the high end of the crisis continuum is fighting and winning major theater wars. This mission is the most stressing requirement for the U.S. military. In order to protect American interests around the globe, U.S. forces must continue to be able to overmatch the military power of regional states with interests hostile to our own. Such states are often capable of fielding sizable military forces that can cause serious imbalances in military power within regions important to the United States. Allies and friendly states often find it difficult to match the power of a potentially aggressive neighbor. To deter aggression, prevent coercion of allied or friendly governments, and defeat aggression should it occur, we must prepare U.S. forces to confront this scale of threat far from home, in concert with our allies and friends, but unilaterally if necessary. Toward this end, we must have jointly trained and interoperable forces that can deploy quickly across great distances to supplement forward stationed and deployed U.S. forces, to assist a threatened nation, rapidly stop an enemy invasion, and defeat an aggressor.
>
> As a global power with worldwide interests, it is imperative that the United States now and for the foreseeable future be able to deter and defeat large-scale, cross-border aggression in two distant theaters in overlapping time frames, preferably in concert with regional allies. Maintaining this core capability is central to credibly deterring opportunism - that is, to avoiding a situation in which an aggressor in one region might be tempted to take advantage when U.S. forces are heavily committed elsewhere - and to ensuring that the United States has sufficient military capabilities to deter or defeat aggression by an adversary that is larger, or under circumstances that are more difficult, than expected. This is particularly important in a highly dynamic and uncertain security environment. We can never know with certainty when or where the next major theater war will occur, who our next adversary will be, how an enemy will fight, who will join us in a coalition, or precisely what demands will be placed on U.S. forces. Indeed, history has repeatedly shown that we are often unable to predict such matters. A force sized and equipped for deterring and defeating aggression in more than one theater ensures the United States will maintain the flexibility to cope with the unpredictable and unexpected. Such a capability is the *sine qua non* of a superpower and is essential to the credibility of our overall national security strategy. It also supports our continued engagement in shaping the international environment to reduce the chances that such threats will develop in the first place.
>
> If the United States were to forego its ability to defeat aggression in more than one theater at a time, our standing as a global power, as the security partner of choice, and as the leader of the international community would be called into question. Indeed, some allies would undoubtedly read a one-war capability as a signal that the United States, if heavily engaged elsewhere, would no longer be able to help defend their interests. Such a capability could also inhibit the United States from responding to a crisis promptly enough, or even at all, for fear of committing the bulk of our forces and making ourselves vulnerable in other regions. This fact is also unlikely to escape the attention of potential adversaries. A one-theater war capacity would risk undermining both deterrence and the credibility of U.S. security commitments in key regions of the world. This, in turn, could cause allies and friends to adopt more divergent defense policies and postures, thereby weakening the web of alliances and coalitions on which we rely to protect our interests abroad.
>
> Obviously, in this dynamic, uncertain security environment, the United States must continually reassess the environment, our strategy, and the associated military requirements. If the security environment were to change dramatically and threats of large-scale aggression were to grow or diminish significantly, it

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would be both prudent and appropriate for the United States to review and reappraise its warfighting requirements.

At least three particularly challenging requirements associated with fighting and winning major theater wars merit special attention. The first is being able to rapidly defeat initial enemy advances short of their objectives in two theaters in close succession, one followed almost immediately by another. Maintaining this capability is absolutely critical to the United States' ability to seize the initiative in both theaters and to minimize the amount of territory we and our allies must regain from the enemies. Failure to halt an enemy invasion rapidly can make the subsequent campaign to evict enemy forces from captured territory much more difficult, lengthy, and costly. It could also weaken coalition support, undermine U.S. credibility, and increase the risk of conflict elsewhere.

Another especially challenging requirement is to be able to achieve our war aims against an adversary who uses or threatens to use NBC weapons, information warfare, terrorism, or other asymmetric means against us. Because of the prevalence of such capabilities in the hands of potential future adversaries and the likelihood that such adversaries would resort to such means in the face of overwhelming U.S. conventional dominance, U.S. forces must plan and prepare to fight and win major theater wars under such conditions.

In particular, the threat or use of chemical and biological weapons (CBW) is a likely condition of future warfare, including in the early stages of war to disrupt U.S. operations and logistics. These weapons may be delivered by ballistic missiles, cruise missiles, aircraft, special operations forces, or other means. To meet this challenge, as well as the possibility that CBW might also be used in some smaller-scale contingencies, U.S. forces must be properly trained and equipped to operate effectively and decisively in the face of CBW attacks. This requires that the U.S. military continue to improve its capabilities to locate and destroy such CBW, preferably before they can be used, and defend against and manage the consequences of CBW if they are used. But capability enhancements alone are not enough. Equally important will be adapting U.S. doctrine, operational concepts, training, and exercises to take full account of the threat posed by CBW as well as other likely asymmetric threats. Moreover, given that the United States will most likely conduct future operations in coalition with others, we must also encourage our friends and allies to train and equip their forces for effective operations in CBW environments.

Finally, as noted above, U.S. forces must also be able to transition to fighting major theater wars from a posture of global engagement - that is, from substantial levels of peacetime engagement overseas as well as multiple concurrent smaller-scale contingency operations. In the event of one major theater war, the United States would need to be extremely selective in making any additional commitments to either engagement activities or smaller-scale contingency operations. We would likely also choose to begin disengaging from those activities and operations not deemed to involve vital U.S. interests in order to better posture our forces to deter the possible outbreak of a second war. In the event of two such conflicts, U.S. forces would be withdrawn from peacetime engagement activities and smaller-scale contingency operations as quickly as possible to be readied for war.

Because both the nature of the threats we face and the way in which we will choose to fight future conflicts are changing, the forces and capabilities required to uphold this two-theater element of the strategy will differ from the "Major Regional Conflict building blocks" developed in the 1993 Bottom-Up Review. Specifically, the accelerating incorporation of new technologies and operational concepts into the force calls for a reexamination of the forces and capabilities required for fighting and winning major theater wars. As U.S. and enemy forces change in effectiveness, these force requirements will change.

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The US does not provide a large amount of unclassified detail on the power projection capabilities it plans to provide to implement this strategy in the Gulf. However, the war in Kosovo in 1999, showed both US strength and that the ongoing cuts and underfunding in the total size of US forces inevitably limit the power the US can project overseas, which is the critical factor determining US war-fighting capabilities in any serious contingency in the Gulf.

The 1997 Quadrennial Defense Review set goals did calling for six Army land-based brigade sets of prepositioned equipment (three in Europe, one in Korea, two in Southwest Asia) plus a Marine brigade set in Norway, and significant stocks of prepositioned equipment afloat - three Marine Corps Maritime Prepositioning Ship squadrons, one heavy brigade set of Army equipment, and selected munitions for the Air Force. Consideration is being given to creating a third heavy brigade set for Southwest Asia. It called for airlift capability of approximately 50 million ton-miles per day, and a surge sealift capacity of 10 million square feet, made up of fast sealift ships, large medium-speed roll-on/roll-off (LMSR) vessels, and the Ready Reserve Force. It called for an afloat prepositioned cargo capacity of four million square feet for the Army and Marine Corps and a complementary land-based prepositioning program.

Present US expeditionary capabilities now seem to be limited to the deployment of about one corps of ground troops over a period no shorter than 75 days, plus several additional light US Army divisions and up to two Marine Expeditionary Forces. The US also can only deploy and support about 50-66% of its 13 USAF fighter wings, and 50-66% of its US Navy and Marine Corps tactical air power, in sustained combat.

Put differently, the US can only deploy about 45% to 60% of the total deployable land forces to any one contingency that the US used to create a two Corps force in Desert Storm, and only about 60-70% % of the total air power. It is also important to note in this context that the US often employed 60% or more of its world-wide assets of special purpose aircraft and logistic equipment during Desert Storm, and these total assets have since suffered from significant force

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cuts.[421] This became all too clear in Kosovo, where the US ran into shortfalls in key systems like electronic warfare aircraft and precision guided munitions.

Further, US contingency capabilities depend heavily on strategic warning. The US has many rapid deployment capabilities that can deal with low to mid- intensity conflicts. It takes time, however, to deploy and sustain a full corps of expeditionary forces and the massive levels of air power the US would need for a high-intensity or major regional conflict in the Gulf.

The US can deploy its air and missile power relatively quickly but it would need one to two months of strategic warning, and take action on that warning to use its airlift and sealift to fully deploy a corps-sized force in Kuwait if it sought to act before Iraq could attack. It would take additional months to redeploy US forces if US power projection capabilities where already involved in a second contingency. Further, the US would begin to encounter major problems from a lack of long lead-spares if it suffered serious attrition in even one contingency and does not have the stocks of munitions and supplies to support two near simultaneous intense conflicts or the industrial base to rapidly replenish its existing stocks. The US would face particular problems in producing the advanced and precision-guided munitions necessary to exploit its technical edge and minimize US and allied losses.

In short, key aspects of US expeditionary capabilities for any contingency involving a major land war in the Gulf depend heavily on strategic warning as well as prepositioning and support from US regional allies. Moreover, the constraints on US forces and readiness have effectively denied the US the ability to fight more than one contingency at a time. Cuts in spending, modernization, forces, and readiness also mean, however, that "near simultaneous" is slowly slipping from a real-world gap of about six months between US ability to win in one contingency and fully deploy to another contingency, to a gap of roughly nine to 15 months depending on the seriousness of each contingency. This growing inability to implement a strategy of being able to fight "two near simultaneous regional contingencies" scarcely means US military power is crippled, but it does mean that any analysis of the evolving US contingency capabilities

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in the Gulf must increasingly take into account the global limits on US military power, and the risk that US forces needed in the Gulf may be engaged in other contingencies.

Regardless of the strategy the US declares, any US military planners, including senior planners in the Joint Staff and the military staffs of the US services, believe that these cuts have effectively reduced the to one major contingency strategy. They feel that the US is already in the process of adopting a single MRC, or "win-hold-win" strategy, in which the US would only be able to fight one major contingency at a time, and could do little more than conduct air and missile attacks in second -- although the US has improved its ability to use air and missile power to strike at any aggressor during the "hold" phase of a second contingency.

The fact that the US is now forced into a "win-hold-win" or single major contingency strategy must also be kept in careful perspective. It can be argued that sizing US forces for two near simultaneous major regional contingencies is planning for a worst-case scenario, and that there is little probability that the US will have to fight major conflict in the Gulf and Korea at the same time. It can also be argued that even if two crises do occur at the same time, the US could focus on the more serious threat and adopt an aggressive variant of a "win-hold-win" strategy in dealing with the less serious case. Even under worst-case conditions, the US should be able to bring powerful air and missile assets to bear in a Gulf contingency and to begin offensive attacks on enemy strategic and tactical targets during the "hold" phase of such a conflict.

The US may not always be able to "hold" in a worst-case contingency like an all-out Iraqi attack on northern Kuwait, or an Iranian grab of some strategic island or location in the Gulf. However, Iran and Iraq have no prospect of being able to attack with impunity or to see the US paralyzed or forced into a purely defensive role because of an involvement in a contingency or contingencies outside the Gulf region.

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Modifying the Phases of Conflict

There have been other changes in US strategy and capabilities which improve US war fighting capabilities in the Gulf. One of the most important changes US planners made in the early 1990s was to modify the objectives assigned to each phase of a war in the Gulf. They realize that future aggressors may not repeat Iraq's decision to stop at a given border and may advance much more quickly in an effort to create decisive "facts on the ground" before the US can react. As a result, the US is placing far more emphasis on decisive action during the "halt phase."

Rather than simply trying to check the enemy's advance during the "halt phase," US planners now envisage a campaign of aggressive engagement aimed at seriously degrading enemy military capabilities at the start of any enemy attack, and reducing the requirement for US forces during the build-up phase. This emphasis on decisive engagement has increased the US emphasis on early offensive air and missile strikes, including both strategic and tactical attacks on a potential enemy, on forward presence, and on rapidly deployable offensive strike forces.

This change in strategy and in the planned phases of US military action in a Gulf War allows the US to exploit one of the key lessons of the Gulf War: a strategic and tactical air and missile offensive could begin immediately, without waiting to win air superiority or to deploy the land forces necessary to commence an offensive AirLand battle. This change allows the US to exploit the steadily improving air and missile technology it demonstrated in Kosovo, it allows the US to quickly exploit advantages like "stealth," "24 hour" air operations, greatly improved near real-time targeting, precision stand-off attack capability, and greatly improved anti-armor and hard-point attack capabilities. It reduces the risk of having to deal with *fait accomplis* and having to liberate friendly territory, and ensures that an aggressor will come under immediate strategic pressure in the form of attacks on homeland targets of critical value to an attacking nation's leadership. This exploitation of air and missile power is an essential complement and preface to the improvements that the US is making in its capabilities for the AirLand battle.

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Other Improvements in US Conventional Capabilities Since the Gulf War

In spite of the cuts in the total size of US forces, the US has been able to react to many of the detailed lessons of the Gulf War, to make significant improvements in organization and training, and to improve "jointness" and its capability to conduct highly sophisticated combined operations.

The US has already demonstrated some of the benefits of these force improvements in Bosnia, Desert Fox, and Kosovo. While the US did continue to experience serious problems in the coordination of National Technical Means within its intelligence community, it achieved a substantially higher level of accuracy in precision air strikes. Its performance reflected training by simulating missions before their execution, better air defense weapons suppression planning and strikes, better resources in terms of laser illuminators and advanced attack avionics, more effective use of daytime strikes, better reconnaissance and targeting and the use of advanced UAVs, substantial improvements in the C^4I systems and organization used to task strikes, use of improved Tomahawk missiles and some types of precision ordnance, and improved battle damage assessment.[422]

The US also is scarcely the only power which has encountered resource and modernization problems. As the last chapter has shown, it is in the fortunate position that its major potential opponents in the Gulf have faced far more serious problems. Iran and Iraq now have much smaller total conventional forces than the US used in sizing the nominal threat for a major regional contingency in the Bottom Up Review and Quadrennial Defense Review. It seems likely that the US will retain the ability to intervene decisively in the Gulf against any current conventional threat posed by Iran or Iraq.

Uncertainties in Future US Power Projection Capabilities

These contradictory trends, and the fact so few unclassified details are available on the details of US contingency capabilities in the Gulf, make it extremely difficult to draw a balance

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between the impact of the cuts in the total size of US forces and long-term readiness and the improvements the US has made in the ability of its remaining forces to fight in the Gulf area. It is clear, however, that US capabilities in the Gulf will be shaped largely by how the US deals with the key military uncertainties that affect the size, readiness, and modernization of the forces it relies on in deploying to Southwest Asia.

The most serious uncertainties affect the overall funding and pace of the procurement of the modern aircraft, land weapons, ships, and advanced munitions the US needs to maintain a decisive edge over all regional opponents, and surge massive amounts of force into the Gulf with minimal time and warning. There are, however, many more specific areas of uncertainty. These areas include:[423]

- *US Army force strength:* The Army faces serious funding constraints, however, that it may force it to hollow out some aspects of its planned 10 division force structure, with an inevitable impact on readiness and power projection capabilities. Further, the Army could be forced into further cuts in future years.
- *US Army readiness for power projection***:** The US Army now plans its power projection capabilities around its Contingency Corps (XVIII Airborne Corps) which consists primarily of three light divisions (the 82nd Airborne Division, 101st Air Assault Division, and 10th Mountain Division) and one heavy division (the 24 Mechanized Infantry Division). The US Army has a goal of being able to deploy the entire four division corps to the Gulf in 75 days by 1998, and one light and two heavy divisions in 30 days.[424] The Army also has a Reinforcing Corps (III Corps), which consists of five divisions. Three of these divisions, however, are active divisions that require Army Reserve and National Guard Round outs, and two are reserve component divisions. The Army also has some separate brigades and additional ranger and special forces units.
- *US Army heavy divisions:* The US Army is seeking to create new, lighter, and more mobile heavy forces as a result of the lessons it learned in Kosovo. Implementation of redesigned heavy Army divisions has resulted in the following changes: one less combat company per combat battalion, a dedicated reconnaissance troop assigned to each brigade, a shift of organic combat service support assets from combat battalions to forward support battalions, and an increased emphasis on command, control, and information support structures. The Total Army Analysis for FY 2003 and FY 2005 identified adjustments to the support needed to sustain Army combat forces across the range of military operations. As a result, the Army is taking steps to convert lower–priority support and combat units to higher–priority support units. Pending the completion of the Total Army Analysis FY 2007, the Army will continue to work with its reserve components (including representatives of the Adjutants General) to refine options for reconfiguring appropriate reserve units so that they mirror active units and maintain their relevancy to national needs. At present, however, Contingency Corps consists primarily of light forces, is a relatively limited land component to fight a high-intensity armored battle in a major regional conflict, and the capability of the Reinforcing Corps to fight such an armored conflict without more than three to five months of prior preparation and deployment is uncertain.

  The Army also faces problems in supporting these forces. It is modernizing much of its equipment, but at a far slower rate than was planned in 1990, and many important programs have been slipped or canceled -

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- including the armored gun system. The US Army has also had to cut back on stock levels and munitions modernization plans since the early 1990s. These cuts mean a significant cut in the technical superiority or "edge" the US Army can deploy in future regional contingencies and they have been accompanied by significant cuts in the longer term aspects of readiness. It is unclear that the US Army is fully funded to modernize and improve its ability to rapidly deploy units from casernes to sea and air ports, or to conduct the kind of advanced large-scale air-missile and AirLand training needed to be fully ready for a contingency in the Gulf.[425]

Equally important, the Army has been forced to rely on National Guard and Army Reserve combat support and service support units for deployment of many of its contingency forces although these can present serious political problems in calling up the necessary reserves, and many proved to have C-4 or C-5 readiness during Desert Shield.

- *Army light divisions:* These developments are occurring at a time when the US Army is becoming steadily more dependent on airlift to rapidly move firepower. The cancellation of the US Army Armored Gun System (AGS) -- which was to replace the obsolete M-551 Sheridan in the 82nd Airborne Division -- has forced the Army to consider rapid air deployment of the Bradley as a substitute. While the C-17 can carry one M-1A2 Abrams, it requires at least a 2,800 foot hard runway to do so and runway length increases with temperature and altitude. The Bradley weights less than half the weight of the M-1A2, and a C-17 can carry up to three Bradleys if equipment is taken off them to reduce their weight. The question is whether the TOW missiles and 25 mm chain gun on the Bradley can substitute for the 105 mm gun on the AGS. US light divisions may lack the tank-killing power and mobility they need.[426] The Army's plans also call for the immediate creation of new, more responsive brigades that will initially use surrogate equipment and loaned vehicles. Off–the–shelf medium armored vehicles will then be procured to extend this capability in the interim until technology allows for the fielding of a new family of combat vehicles. The long–term goal is to erase the distinction between traditional heavy and light forces, thereby creating a standard force (termed the Objective Force) for the entire Army that is both more responsive and more capable. The question is how soon these reforms will be implemented and how effective they will prove to be.

- *US Carrier strength:* US commitments in other areas and declines in readiness and carrier strength have made it progressively hard to deploy a carrier in the Gulf, and two carriers in the Gulf and Mediterranean/Red Sea areas. The US Navy has increasing been forced to leave gaps in carrier coverage, although the US has compensated in the past by deploying USAF fighters to Bahrain and Jordan. Until late 1998, the Navy deployed a CVBG and an ARG about 75 and 80 percent of the time, respectively, in the Mediterranean; about 75 and 50 percent of the time, respectively, in the Indian Ocean; and on a nearly continuous basis in the western Pacific. Since 1999, a CVBG has been deployed in the Southwest Asian region on a continuous basis to support contingency operations. Maintaining a continuous presence in that theater has been accomplished by adjusting CVBG deployments in other regions. Plans call for a CVBG to be deployed continuously in Southwest Asia through FY 2001, thus obviating the need for the Air Force to provide AEFs to fill any gaps in CVBG presence[427]

- *US Marine Corps capabilities for mid to high-intensity conflict:* Marine units are employed as part of Marine Air–Ground Task Forces (MAGTFs) consisting of four elements: command, ground combat, aviation combat, and combat service support. A Marine expeditionary force (MEF) is the largest MAGTF organized for combat, comprising one or more divisions, aircraft wings, and force service support groups. The Marine Corps maintains three MEFs in the active force, headquartered in California (I MEF), North Carolina (II MEF), and Okinawa (III MEF). Embarked on amphibious ships, MEU(SOC)s (consisting of about 2,000 Marines each) are task–organized and forward deployed continuously in or near regions of vital U.S. interest. The Marine Corps found during the Gulf War that it lacked the heavy armor for high-intensity regional conflicts, lacked sufficient artillery firepower and mobility, needed improved air support capability, needed improved tactical airlift, and needed at least one additional prepositioning ship per

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MEB. The Marine Corps has obtained some additional M-1A1 tanks from the Army and has upgraded the avionics and precision strike capabilities of its AV-8Bs and F/A-18s. It has not, however, acquired the number of tanks it originally sought, has seen plans to modernize its AAVs slip by half a decade or more, and must rely on towed 155 mm artillery that must be supplemented by the deployment of supporting US Army units in mid to high-intensity combat. It continues to experience major delays in modernizing its tactical lift and will not acquire the added prepositioning ship for each MEB it once sought. Equally important, the Gulf War demonstrated that the USMC lacked the sustainment capability for intensive land warfare. At present, the Marine Corps can only sustain about 1.5 to 2 of its three MEFs in intense combat for more than 30-45 days.

- *US amphibious lift capabilities:* The downsizing of the US Navy and the potential block obsolescence of some aspects of US amphibious lift create significant potential problems in terms of maintaining forward deployed carrier task forces and adequate amphibious assault capabilities. These problems have been increased by the long delay in modernizing Marine Corps tactical airlift, and the need for improved vertical lift capability to counter the improved mine warfare capabilities in areas like the Gulf. These problems could significantly affect US capabilities in a high-intensity regional conflict in the Gulf, and USN studies project a potential problem in amphibious lift retirements and modernization after 2005. Amphibious forces are typically employed in three–ship ARGs. A vital component of the maritime force structure, ARGs provide the ability to project forces into littoral regions rapidly from points over the horizon, utilizing both air and surface platforms. During Operation Allied Force, Marines from two ARG/MEUs demonstrated the flexibility that amphibious forces bring to bear in contingencies by simultaneously conducting attack missions in support of the air campaign while providing humanitarian assistance and protection for displaced Kosovars. The FY 2001–2005 program sustains a 12–ARG force capable of supporting three forward–deployed Marine expeditionary units in peacetime and lifting the equivalent of 2.5 Marine expeditionary brigades (MEBs) in wartime. By FY 2005, the amphibious force will consist of 38 active and two reserve ships, including six new San Antonio–class LPD–17 amphibious transport dock ships.[428]

- *US mine warfare capabilities:* The funding of US mine warfare capabilities remains uncertain. The US Navy is currently focusing on shallow water assault breaching, distributed explosive technology, and remote minehunting systems, and has accelerated the airborne mine neutralization system. It is continuing to fund upgrades to mechanical sweep systems, unmanned underwater vehicles, remote mine hunting systems and the Quickstrike mine.[429] The Navy, however, has sought at least $40 million more per year in the past for mine warfare to speed up the deployment of mine countermeasure capabilities. It is seeking more funds for mine countermeasure ships, airborne mine hunting helicopters, divers for mine clearing, route surveys of ocean lanes and a mine warfare data base on underwater obstacles, new C^4I/BM systems for mine warfare, mine tracking systems, and deployment of the Remote Minehunting System and Magic Lantern laser mine detection system.

- *US bomber forces*: Congressional efforts to procure more B-2s have delayed the upgrading of the US bomber force and have left questions about the ability of the B-2 and B-1B to meet their goals for delivery of smart weapons like the Sensor Fused Weapon with the lethality projected in US plans. In a major theater war, bombers need to deliver large quantities of unguided general–purpose bombs and cluster munitions against area targets, such as ground units, airfields, and rail yards. Bomber forces will also play a key role in delivering precision–guided munitions (including cruise missiles) against point targets, such as command and control facilities and air defense sites. The ability of these forces to have an immediate impact on a conflict by slowing the advance of enemy forces, suppressing enemy air defenses, and inflicting massive damage on an enemy's strategic infrastructure can only expand as new munitions are deployed. More advanced weapons now entering the inventory or in development will enable bomber forces to bring a wider range of targets under attack, while taking advantage of the bombers' large payloads. The rapid–response, long–range capability provided by bombers could make them the first

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major U.S. weapon system on the scene in a fast–breaking crisis. The bomber inventory currently includes 208 aircraft—94 B–52s, 93 B–1s, and 21 B–2s. The B–52 force is programmed to decline to 76 aircraft in FY 2001. Within the existing inventory, 44 B–52s and 52 B–1s are primary mission aircraft, fully funded in terms of operations and maintenance, load crews, and spare parts, and ready for immediate deployment. An additional 12 B–52s are held ready for nuclear missions. All B–52s and B–1s in the inventory, including those in attrition reserve, will be kept in flyable condition and will receive planned modifications. B–1 primary mission aircraft will rise to 70 by 2004, when increasingly capable conventional weapons become available. Bombers will be an integral part of the expeditionary air force, with both B–1s and B–52s available for AEF deployments.[430]

- *US air and missile strike capabilities*: Two major issues are unresolved in current US force plans which will have a major impact on US capabilities to conduct long-range air strikes. The US does not have a clear detailed credible plan for bomber modernization, and for providing the advanced munitions, targeting, and C^4I/BM capabilities needed to operate any given mix of the B-52/B-1, and B-2 in combat. At the same time, the US Air Force and US Navy have canceled the A-12 and A-X, the USN is withdrawing the A-6 from service in 1997, and the USAF is debating withdrawing the F-111. Even if the Joint Advanced Strike Aircraft (JAST) program should be funded, the US will have no plans to deliver a new long-range strike-attack aircraft that can be used by carrier aviation, the Marine Corps, and the USAF until well after the year 2010.[431]

  The US is upgrading its cruise missile and stand-off strike missiles. Key new systems like the JSOW and SLAM-ER are on schedule, and the TLAM is being upgraded. The TSSAM cruise missile program has been canceled, however, and funds seem likely to be lacking for adequate procurement of the JSOW, SLAM-ER, and TLAM.

  The US has partially compensated for these problems (a) by improving the strike/attack capabilities of existing aircraft like the AV-8B, F-15E, F-16, and F/A-18C/D, (b) by procuring the F/A-18E/F for US carrier forces, and (c) by providing a stealth strike capability for the F-22 air superiority fighter. The fact remains, however, that there is no coherence or stability to US plans to improve long-range strike capabilities, and these capabilities will improve at only a fraction of the rate planned in 1990. The current US force plan conceals role and mission debates, inter-service debates, and program uncertainties that badly need to be resolved.

- *Target acquisition and analysis/battle damage assessment capability (BDA):* In spite of USCENTCOM and other US efforts to improve target acquisition and BDA capability, US intelligence officers and some air war planners feel that the US experience in Desert Fox and the war in Kosovo has shown that the Department of Defense has failed to react adequately to the lessons of the Gulf War in developing improved regional capabilities for targeting and battle damage assessment capability to support US C^4I/BM capabilities and improved precision strike capabilities. They feel the US has failed to develop adequate regional strike plans against Iran and Iraq, that many target acquisition systems lag far beyond schedule, and that the improvements made in BDA that have been made so far are more bureaucratic cosmetics than real improvements.

- *US mobility forces:* The 1997 Quadrennial Defense Review set goals calling for six Army land-based brigade sets of prepositioned equipment (three in Europe, one in Korea, two in Southwest Asia) plus a Marine brigade set in Norway, and significant stocks of prepositioned equipment afloat - three Marine Corps Maritime Prepositioning Ship squadrons, one heavy brigade set of Army equipment, and selected munitions for the Air Force. Consideration is being given to creating a third heavy brigade set for Southwest Asia. It called for airlift capability of approximately 50 million ton-miles per day, and a surge sealift capacity of 10 million square feet, made up of fast sealift ships, large medium-speed roll-on/roll-off (LMSR) vessels, and the Ready Reserve Force. It called for an afloat prepositioned cargo capacity of four million square feet for the Army and Marine Corps and a complementary land-based prepositioning

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program. The overall availability and readiness of these capabilities is not described in detail in the open defense literature.[432]

- *US sealift:* US sealift plays a critical role in deployment to the Gulf, although sheer distance inevitably limits the speed of reaction. It is 8,600 sea miles and 20+ days sailing time from the US east coast to the Gulf through the Suez Canal and 11,400 sea miles and 26+ days sailing time around Africa. Much of US sealift is in reserve, and has uncertain readiness, or relies on strategic warning to assemble large fleets of commercial ships:

  - There are major ongoing improvements in US sealift. The most rapidly deployable elements of US sealift include the Army prepositioning ships (AR-3), which include seven RO-ROs from the RRF, one auxiliary crane ship, three barge carriers (LASH), and one heavy prepositioning ship (HLPS). This force can carry about 40% of the equipment needed to deploy and sustain one brigade, and each RO-RO ship can either carry the equipment for an armored battalion (51 M-1A1 tanks) or the equipment for a mechanized battalion (72 M-2 Bradleys.) The total force can carry about 40% of the total equipment load for two armored battalions, two mechanized battalions, and the required transportation, engineer, supply, medical, and maintenance units. At present, 4 RO-ROs, 3 LASH, and 1 HLPS out of this total are deployed in the Indian Ocean and homeported in Diego Garcia, and the US is seeking to homeport the rest in Thailand. [433]

  - The four Navy ships include three tankers and one 500 bed hospital. The 13 USMC ships include three squadrons, each of which support one Marine Expeditionary Force of about 16,000 men. They each hold about 30 M-1A1 tanks (being increased to 58), 109 AAVs, 30 M-198 howitzers, 289 5 ton trucks, 530 HUMMWVs, 10 LCM-8s, and 35 causeway sections. The four USAF ships provide sustainment and ammunition. [434]

    The total present surge capability of the MSC is also only about 45% of the total requirement called for in US mobility requirements. To meet its requirements, the US must acquire 19 large medium-speed roll on/roll off (LMSR) ships and two more container ships. The total requirement for the RRF is 36 RO-RO ships. The US had 17 before Desert Shield, is acquiring 12, and needs 7 more.

  - The majority of government–owned ships are maintained in the Ready Reserve Force. This 87–ship fleet is composed primarily of RO/RO vessels, breakbulk ships, and tankers held at various levels of readiness. The Navy states that more than half of the ships are able to get underway in four to five days; the remainder can be readied for service in 10, 20, or 30 days. Other sources indicate that the US is badly underfunding the readiness of its RRF ships.

  - Augmenting the Ready Reserve Force are eight fast sealift ships and two hospital ships manned by partial crews. The fast sealift ships can begin loading on four days' notice, while the hospital ships can be readied for deployment in five days.

  - LMSRs support both the prepositioning program and surge sealift. Once the full 20–ship LMSR fleet is deployed, these vessels will provide nearly all of the afloat prepositioning space required for Army unit equipment and approximately one–third of surge sealift capacity. Ten LMSRs have been delivered to date, and eight additional ships are scheduled for delivery by FY 2001. The remaining two vessels will join the fleet by the end of FY 2002. One LMSR, slated for deployment with the Maritime Prepositioning Force (MPF), will be configured specifically to carry Marine Corps equipment.

  - To support peacetime operations, the Department charters dry cargo ships and tankers from commercial operators. These ships transport military cargo to locations not normally served by commercial routes. The U.S.–flag commercial fleet contains 198 ships with military utility. These include 110 dry cargo ships, 87 tankers, and one passenger ship. Another 175 commercial vessels that could contribute to military missions—81 dry cargo ships, 84 tankers, and 10 passenger ships—are

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maintained in the Effective U.S. Control (EUSC) fleet. These ships are owned by U.S. companies or their foreign subsidiaries and are registered in nations whose laws do not preclude the ships' requisitioning for military operations. A number of the commercial vessels listed above can be made available for military contingencies under the Voluntary Intermodal Sealift Agreement (VISA), maintained by the Departments of Defense and Transportation with commercial cargo carriers. VISA provides access to commercial shipping capacity and to the intermodal capabilities of commercial carriers, such as rail, truck, and pier facilities. As with the CRAF program for airlift, VISA is structured to make sealift available in stages.

- *US prepositioning:* In Southwest Asia, the Army stocks equipment for two heavy armor brigades. One brigade set is prepositioned in Kuwait, and the other set—which includes equipment to support a division headquarters—is located in Qatar. The Air Force stores air base operation sets in the region, many of which are being used to support contingency operations.

  The US uses a mix of government–owned ships and commercial vessels to stockpile materiel at sea. Army equipment and supplies are carried aboard a fleet of chartered vessels, LMSRs, and an RRF ship. Stationed in the Indian and Pacific Oceans, these ships provide materiel for an armor brigade and selected combat support and combat service support units. Additionally, the fleet carries Army watercraft for port–opening operations. Plans call for an additional Army brigade set to be prepositioned afloat by FY 2001. Marine Corps equipment and supplies are carried on a mix of vessels operating with the Maritime Prepositioning Force. The ships are organized into three squadrons, each capable of supporting a 17,300–person MEB for 30 days. The squadrons are stationed in the western Pacific, Indian Ocean, and Mediterranean Sea. The MPF will receive a new ship in FY 2000, and two additional vessels will join the force by the end of FY 2002. The new ships, converted specifically for MPF operations, will be allocated among the three MPF squadrons.

  The sea–based prepositioning force also includes chartered ships carrying Air Force munitions and a Navy fleet (ashore) hospital. The remaining vessels—a government–owned tanker and two RRF ships specially equipped to transfer fuel directly ashore—are maintained for use by all U.S. forces. During Operation Allied Force, ammunition from one of the Air Force–chartered ships was used to support air combat operations in Kosovo.

  These capabilities meet many important requirements, but even the rapidly deployable elements are still underfunded. The US Army currently can only preposition about 40% of a full 2X2 combat brigade and combat support/combat service support slice. It does not have the ability to provide 30 days of sealift for sustainment of its 4 division contingency force.

- *US airlift:* The Gulf is 7,000 air miles and 24 hours flight time from the US. The US cut its total requirement for strategic airlift from 57 MTM/D to 52 MTM/D during the Bottom Up Review, and even further in the Quadrennial Defense Review in 1997. Even so, there is little probability that it will meet its goals. The DoD has established an intertheater airlift objective of about 50 million ton–miles per day (MTM/D) of cargo capacity. Of that amount, about 20 MTM/D is provided by commercial aircraft, which contribute to military missions as participants in the Civil Reserve Air Fleet (CRAF). The remaining 30 MTM/D of intertheater airlift capacity is provided by military aircraft, which are designed to perform missions that cannot be flown by commercial planes. The Department will have an organic strategic airlift capacity of 27 MTM/D at the end of FY 2001. By the end of FY 2001, the military airlift fleet will consist of 58 C–17s, 88 C–141s, 104 C–5s, and 418 C–130s (all figures denote aircraft assigned for performance of their wartime missions). These aircraft are operated by active, Air National Guard, and Air Force Reserve squadrons.[435] The C-141 has only about five more years of useful life and the USAF must deal with the near-term implications of a combination of the aging of the C-141, delays in the C-17, and cost problems in procuring the C-17 and other lift aircraft.[436]

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USAF plans call for procurement of 120 C-17s, but still indicate that US strategic and tactical airlift will be limited to less than 90% of the current requirement until the end of the present planning period (2020), even if the C-17 is fully funded and a new aircraft type is purchased to supplement the C-17. The US also has no attrition reserve of lift aircraft, and its current plans make no allowance for any peacetime or wartime attrition of USAF lift aircraft for nearly the next quarter century. Current plans also conceal the fact that the USAF only has enough major long lead spare for its strategic lift aircraft for about 45 days of high-intensity wartime operations. It seems likely that the US will face major lift capacity problems by the end of the 1990s, and may be reduced to about 80% of its present requirement.[437]

- *Readiness and sustainment:* In spite of Department of Defense claims that readiness is not declining, each of the services states that current funds are not adequate and that the cost of peacekeeping and other partially funded unprogrammed operations continues to force declines in training, combat and support unit readiness, stock levels, depot and major maintenance, and refits. Many air, naval, and Marine Corps units are forced to deploy much longer than is desirable, and this is stressing manpower as well as equipment.
- *Theater missile defense systems*: The US has invested heavily in the development of theater missile defense systems like the Patriot Advanced Capability 3, the Theater High Altitude Area Defense (THAAD), and Navy lower tier program. It has not, however, been able to create a stable deployment program. The wide area capabilities of its systems are now limited by US mishandling of negotiations with Russia over the ABM treaty, and initiatives to create a "net" of land-based surface-to-air missile in the Southern Gulf countries have made only limited progress. This means that US deployment of effective ATBM capabilities may lag behind Iranian missile deployments, and that progress in creating an effective joint US-Southern Gulf surface-to-air missiles/ATBM capability may be limited or inadequate.[438]
- *Chemical and Biological Warfare Capabilities:* Development and/or deployment of improved detection systems, protective gear and equipment, decontamination gear, and vaccines/medical systems still lags behind the goals the US set immediately after the Gulf War.[439]

The Paradox of Coalition Warfare

There is another set of uncertainties that is inherent in the very nature of the US search for force improvement to execute a "revolution in military affairs." Each improvement in US capabilities creates the paradox that the US is potentially increasing the tactical, technical, training, and sustainability problems it faces in coalition warfare in the Southern Gulf at a time when it has a growing need for such support from its allies.

The US has placed far more emphasis on jointness within US forces and upgrading its own technology since the Gulf War than on designing its tactics, weapons, and battle management systems to interoperability with Southern Gulf, British, and other allied forces. The US has bought a much more sophisticated mix of long-range conventional strike assets, air superiority assets, "smart" munitions, and C^4I/BM assets than it possessed during the Gulf War. All of these assets contribute to high technology methods of combat and to an intensity of operations that

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either requires allied forces to have similar capabilities or to be "compartmented" in ways which ensure that they do not interfere with US operations or present problems in terms of friendly fire.

The Coalition-oriented rhetoric of the Gulf War has disguised the fact that many allied contributions had little war fighting value, while others presented almost as many complications as they were worth. The Saudi Air Force, for example, was the only Coalition air force with the technical sophistication to carry out forward air defense operations in combined warfare with the USAF -- in fact, the USN F-14s lacked the proper C^4I assets to be integrated into the air defense operations over the Kuwaiti Theater of Operations.

US forces flew nearly 90% of all strike-attack sorties, and nearly 85% of all strike, attack, and air defense sorties. US air forces dominated every aspect of reconnaissance, electronic warfare, and command and control activity. They flew 90% of all reconnaissance missions, 96% of all command and control missions, and 97% of all electronic warfare missions. With the exception of the RAF, no allied air force made a significant contribution to the air offensive. Allied sorties were generally directed against low-priority static targets, and allied aircraft lacked the avionics and munitions required to achieve the proper lethality and survivability. Even the revised Tornado-Buccaneer force had significant C^4I/BM integration problems in operating with US attack aircraft.

The US was forced to supply most of the theater-wide C^4I/BM links for Coalition forces. The US Defense Satellite Communications System (DSCS) furnished about 75% of intra-theater connectivity during Desert Storm. The US provided virtually all satellite and advanced intelligence collection capability, and still experienced serious problems in the secure dissemination of such data to its own forces -- much less its allies. Britain and Saudi Arabia were the only nations with full access to most threat data.

The US provided the bulk of the heavy armor and artillery committed to Desert Storm, and Britain proved to be the only European power able and willing to provide significant tank strength. In spite of the much-publicized deployment of naval contingents from the smaller NATO

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states and France, these forces contributed nothing to Desert Storm. Britain and the US provided all of the operational naval forces in the upper Gulf. In spite of the fact that several European powers sent mine clearing forces, only British mine forces led the way into combat. Every other Coalition naval contingent stayed safely out of harm's way.

In many cases, the US and/or Saudi Arabia were forced to provide much or most of the support required for smaller Southern Gulf forces, and substantial intra-theater air or land lift. For example, Britain could provide commercial sea-lift, but not airlift. British forces had to make use of US C-5 transports, and British commercial cargo aircraft.

These problems do not prevent allied European and Southern Gulf forces from playing an important role in coalition missions that are relatively repetitive or static in nature, or which do not require the intensity of "24 hour" high-technology warfare. Bosnia and Kosovo have demonstrated that the changes to US forces scarcely preclude coalition operations. There are many contingencies which do not require the intensity of combat and integration of tactics, training, and technology the US is developing for mid and high-intensity conflict. Such contingencies include most peace-making, deterrent or demonstrative operations, and low-intensity combat operations.

At the same time, the US plans to make far more intense use of advanced C^4I/BM than it did at the time of the Gulf War. It is emphasizing the near real-time fusion of all aspects of its C^4I/BM systems in joint operations -- virtually all of which require compatible technology, training, and tactics and which attempt to substitute force quality for force quantity. The US approach to war fighting is becoming more and more complex. Armies that do not adopt advanced digital battle management systems of the kind being developed by the US Army, and which do not have compatible sensors and mobility, will present more problems. Air forces that are not trained in AWACS/JSTARS/ABCCC operations will have less value. Joint forces that lack overall C^4I/BM and joint training capabilities will present growing problems.

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The US will also have progressively fewer lift and sustainability resources to make up for the gaps in coalition force capabilities. It will progressively speed up the rate of offensive air operations in the early phase of battle against a major opponent. This means intensifying the sophistication of operations from the start of a conflict. As a result, US forces are evolving in directions which may make it more and more difficult for moderate technology forces to act as a full partner in sophisticated main-battle operations, and which make it difficult for even advanced technology forces to act as a full partner unless they have fully compatible secure communications, data processing, C^4I/BM systems, and training.

Uncertainties in Future US Contingency Capabilities

There are also problems in US capabilities that are contingency dependent. They are the inevitable result of the geography of the Gulf, and its dependence on the Southern Gulf states to participate in many aspects of their own defense. No US force posture can deal with every risk, and the overall strength of US forces relative to Iran and Iraq is not always the critical issue. As the previous analysis has shown, there are several key contingencies where the US will continue to face problems, regardless of how it budgets its present force structure:

- *A Sudden Iraqi Attack on Kuwait City*: Kuwait and Kuwait City remain vulnerable to a sudden Iraqi attack in which the Republican Guards and/or heavy regular Iraqi units invade Kuwait with only minimal preparation and warning. In spite of the improvements in US power projection capabilities, it is only about 80 to 120 kilometers from the Iraqi border to the edge of Al Jahrah and Kuwait City. Unless US prepositioned land forces and a significant number of Kuwaiti and other Arab land forces are positioned to screen the border and defend at the Mutlah pass north of Al Jahrah, it is unlikely that air power alone can halt a determined Iraqi force, particularly if that force uses some cover like an exercise to limit strategic warning. Once an Iraqi force penetrated into Kuwait City, it would be extremely difficult to dislodge -- particularly if it held the Kuwaiti people hostage. The US would face severe limitations in using use air and artillery firepower.

- *An Iraqi Attack on Kuwait and Eastern Saudi Arabia:* There is little doubt that a combination of US, Kuwaiti, and Saudi forces could defeat any Iraqi invasion in the near to mid-term. There is also no question that the US could carry out devastating air and missile attacks on Iraq in reprisal for such an invasion within days after the Iraqi attack began. If Iraq was willing to take these risks, however, it could almost certainly occupy a substantial part of Kuwait and penetrate into Saudi Arabia before a combination of allied air and land power could halt an Iraqi invasion. Iraq might not only be able to take Al Jahrah and Kuwait City hostage, but also may be able to occupy Saudi cities and towns like Ar'ar, Rafha, and Khafji. Such a "hostage war" would involve massive risks for Iraq, and almost certain eventual defeat, but Iraq has made similar mistakes twice in the recent past. The US would

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need substantial support from Kuwaiti, Saudi, and other Gulf forces to minimize Iraqi success, and much would depend on both warning and immediate reaction to that warning.

- *Iranian pressure or attacks on Kuwait:* Iran demonstrated during the Iran-Iraq War that it could carry out terrorist attacks and assassination attempts in Kuwait using Iranian residents and/or Shi'ite Kuwaitis. It conducted threatening air movements and fired anti-ship missiles from the area around Nahr e-Qasr at naval targets near Kuwait's coast. It is also still suspected of playing a role in the bombings of the National Guard Headquarters in Saudi Arabia and the USAF barracks in Al Khobar. These kinds of low-level attacks must be dealt with largely by Kuwaiti military and security forces.

- *An Iranian War of Intimidation in the Gulf or Gulf of Oman:* Iran does not have the air of sea power to win a naval war in the Gulf, or the amphibious and air assault capability to successfully invade even a small Southern Gulf state like Bahrain. Iran has, however, steadily built up its land and sea-based anti-ship missile capabilities, its air defenses along its southern Gulf coast, the strength of the naval branch of the Revolutionary Guards, its mine warfare capability, and its forces on the islands in the Gulf. It has acquired submarines and can use dhows and other small craft to infiltrate and attack naval and coastal targets. The US, British, and Southern Gulf navies can defeat any regular Iranian naval attack, but these steadily growing Iranian capabilities could be used for less orthodox military purposes, including threats and intimidation, and low-level and unconventional warfare. US forces would find it difficult to patrol the entire Gulf, and maintain the security of Gulf shipping, coastal, and off-shore facilities against such campaigns because of the sheer area to be covered and the unpredictable nature of Iranian actions. The US also cannot produce instant solutions to Iranian attacks. It will take time to prepare for and defeat well-organized Iranian uses of seapower, and the US military cannot guarantee that Iran will not provoke a series of crises or incidents that will lead to temporary success or incidents which temporarily affect the flow of Gulf shipping.

- *Mine Warfare in the Gulf:* Both Iran and Iraq have modern mines which are hard to detect and destroy. Both have large stocks of older mines that can be covertly deployed in the Gulf, or allowed to float in shipping lanes. The US is improving its mine warfare capabilities and has deployed some new mine warfare vessels in the Gulf. Broad coverage of the Gulf, however, requires strong local Southern Gulf mine warfare and maritime surveillance capabilities.

- *Air, missile, and coastal defense against sudden selective raids on critical targets*: The US cannot possibly provide comprehensive defense along a coastal area of more than 1,500 kilometers, or day-to-day coverage of the Gulf. There are many critical ports, oil and gas facilities, desalination plants, power plants, and other facilities that Iran or Iraq could attack successfully in slash and run raids before US forces could respond. Overall air and missile defense capability and maritime and coastal surveillance must be a Southern Gulf responsibility.

- *Divisions among the Southern Gulf States:* The US cannot resolve feuds, tensions, and local conflicts between the Southern Gulf states. It can attempt to mediate or negotiate, but US forces are not a substitute for cooperation and unity within the Southern Gulf, and cannot deal with local quarrels that could divide the Southern Gulf, or lead given states to align themselves with Iran or Iraq.

- *Internal Unrest within a Southern Gulf State:* The US cannot use military force to save a regime from its own mistakes or its own people. Political unrest, extremism, internal violence, and coup attempts could bring a radical regime to power in the Southern Gulf, and change the regional alignments with Iran or Iraq. The US is a non-Arab and non-Islamic power and cannot use force to interfere in Southern Gulf internal issues. Similarly, US naval and air surveillance cannot substitute for local

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defense and internal security capabilities in preventing Iran or Iraq from smuggling in support to local dissidents.

- *Terrorism and Unconventional Warfare:* Terrorism and unconventional warfare can range from attacks on US forces designed to create domestic political problems in the US to the use of weapons of mass destruction against major targets in the Southern Gulf. The US can assist in dealing with such threats, but defense against this kind of low-level or covert threat requires the coverage of the entire Southern Gulf, and must be primarily dependent on local internal security capabilities.

- *Use of Weapons of Mass Destruction:* As is discussed in the next chapter, the stakes change fundamentally if Iran and/or Iraq are willing to use weapons of mass destruction or even threaten the use of such weapons. The US now has far stronger conventional capabilities than capabilities to conduct wars which involve the actual or threatened use of chemical, biological, and nuclear weapons. The US needs to develop much stronger counterproliferation capabilities if it is to deal with such threats, and Southern Gulf countries need to develop the kind of air and missile defenses, and nuclear-biological-chemical (NBC) war fighting capabilities, necessary to give them the resolve, deterrent, and defense capabilities they need to deal with Iranian and Iraqi weapons of mass destruction.

Many of these uncertainties are more an indication of the fact that the Southern Gulf must be ready to play a stronger role in its own defense than an indication of US weakness or vulnerability. The United States alone cannot hope to fill a power vacuum in the Southern Gulf. As is the case in NATO, the defense of the Southern Gulf must be a collective responsibility and even the smallest Gulf nations must play a vital role.

As has been discussed in previous chapters, however, the US is dealing with sovereign countries that will pursue their own strategic interests in a crisis. It is also dealing with nations which often have deep internal divisions which limit the level of cooperation they can implement with the US. The Southern Gulf states all face major cash flow crises which are limiting the force expansion and military modernization, and they have shown little progress in moving away from strategic dependence on the US or in creating effective regional cooperation under the Gulf Cooperation Council. There are always uncertainties in how long the US can preserve the present level of strategic cooperation in the face of internal divisions within the Gulf states, and economic pressures that are leading many Gulf states to limit their military spending and burden sharing expenditures.

At the same time, these arrangements have helped to allow the US to substantially

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increase its power projection capabilities in the Gulf. The US has also been able to increase its number of combined exercises, military construction, and security assistance. The US now carries out roughly 100 joint and combined exercises in the Middle East each year. These exercises include numerous naval and special operations exercises, the Intrinsic Action series in Kuwait, and the Ultimate Resolve series of exercises. These exercises are used to maintain access, promote interoperability with regional partners, enhance the forward presence of US forces, and improve the individual and collective capabilities of the GCC states.

The importance of these improvements in prepositioning and cooperation in the region became clear in October, 1994, when Iraq moved two Republican Guards divisions and three additional divisions to positions near its border with Kuwait. The US was forced to deploy the largest number of US forces to the Gulf since the Gulf War. These power projection forces initially included the 18,000 men in the 1st Marine Expeditionary Force, 16,000 troops from the US Army's 24th Infantry Division, 306 fixed wing aircraft (including A-10s, F-16s, RF-4Cs, F-15Es, F-15Cs, F-111s, EF-111s, F-117s, JSTARS, F/A-18s, B-52s, and E-3As, 58 helicopters (including 54 AH-64s), two batteries of Patriot missiles, and a carrier battle group. The US then decided to deploy another 73 fixed wing aircraft.

By October 12, the US had a total of 19,241 men in the Gulf area (1,923 Army, 11,171 Navy, 1,977 Marine, 3,844 Air Force, 173 Special Operations, and 153 Joint Task Force Headquarters). It had two carrier task forces with 15 ships (counting one carrier battle group in the Red Sea), and 200 combat aircraft. It was deploying significant numbers of aircraft, US Army units were beginning to join the prepositioned US armor in Kuwait, and 5 Marine Corps Maritime Prepositioning Ships, 8 US Army Brigade Afloat Ships, and 6 USAF and US Army Prepositioning Ships were moving towards the Gulf. US forces were involved in combined exercises with Kuwaiti forces in the border area within a matter of days, and the US held a major, demonstrative, anti-armor exercise using B-52-strike aircraft by the end of October. In contrast, the Gulf Cooperation Council was only able to make a token commitment of the Peninsula Shield force -- a force which lacked the combat capability to play any significant role in defending Kuwait.

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While Iraq soon backed down, and the US was able to cut its planned deployments, at one point the US had 210,000 personnel deployed, en route, or on alert.

The US demonstrated a similar mix of resolve and capabilities in late August, 1995, when there were indications that Iraq might again be deploying forces to invade Kuwait. It deployed a total of 12 prepositioning ships from Diego Garcia and other locations to the Gulf, with enough armor, artillery, food, fuel, water, vehicles, and other equipment to sustain a 16,500 Marine Corps MEF (Forward), and a 15,000-17,000 man US Army Corps in combat.[440]

At the same time, the US improved the way in which it reacted to Iraqi provocation. In January 1996, when US intelligence concluded that Iraq had brought five armored divisions to sufficient readiness to deploy to Kuwait with only five hours notice. The US deployed 12 prepositioning ships -- enough to equip a Marine Division and a US Army Brigade -- into the Gulf. The US did not send troops, but this move allowed the US to deploy up to 20,000 troops on short notice. The US also deployed additional combat aircraft to Bahrain and Kuwait, and extended a joint exercise with Kuwait. The US already had some 20,000 troops in the Middle East area, and deployed 35 ships, and 14,000 sailors and US Marines, in its Fifth Fleet between the Suez Canal and Indian Ocean. These forces included the *Nimitz* carrier battle group, and a Marine Corps amphibious ready group. It is interesting to note that the US only had 250 naval personnel stationed permanently ashore in Bahrain.[441]

The Challenge of Adequate Prepositioning

**** In October 2000, the US had a well-distributed forward presence in the Gulf region, supported by significant forces in Turkey and the Eastern Mediterranean. These forces gave the US the core capabilities it needed to deter Iraq and Iran, and to support rapid power projection into the area. At the same time, they kept the US presence in any Gulf country relatively limited, and allowed USCENTCOM to pursue an engagement strategy that minimized the “visibility” of US forces in ways that could cause ethnic and religious resentment, and which emphasized partnership between US and local forces. This US presence – which varies according to the level

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of tension in the region – is summarized in Table VIII-5

Table VIII-5

US Forward Presence in the Gulf Region: October 2000

Country/Fleet	Manpower					Ships	Aircraft
	Army	Air Force	Navy	Marines	Total		
Fifth Fleet (Gulf)	0	0	(12,880---------	-12,880)	12,880	22	66
Bahrain	0	0	900	-	900	-	-
Kuwait	3,000	2,100	10	80	5,190	-	-
Oman	0	630	60	0	690	-	-
Qatar	30	0	0	0	30	-	-
Saudi Arabia	650	4,800	20	250	5,720	-	-
Sub-Total in Gulf	3,680	7,530	(14,200--------	-14,200)	25,410	-	-
Sixth Fleet (E. Med.)	0	0	(13,010---------	-13,010)	13,010	17	66
Turkey	290	1,180	1,900	220	3,599	-	-
Sub-Total	290	1,180	(15,130--------	-15,130)	16,609	-	-
Total Region	3,970	8,710	(29,330--------	-29,330)	42,010	-	-

Source: Washington Post, October 15, 2000, p.A-23

The key problem that the US now faces in shaping its forward presence in the Gulf, in creating effective power preeojection capabilities, and in developing cooperative arrangements with its Gulf allies is to complete the prepositioning of US Army, Marine Corps, and air equipment to the Gulf. The US feels this prepositioning is essential to improve the speed of US deployment capability, and to provide the ability to deter or halt any sudden Iraqi move against Kuwait. Its goal is to have enough prepositioning and forward basing capability by 2000 to deploy 8-10 tactical air wing equivalents within five days, and at least two US Army divisions within two weeks. These forces would be followed by a 4-5 division US Army Corps, a Marine Expeditionary Force, and supporting air wings within eight weeks -- twice as fast as it took to deploy a similar force in 1991.[442]

So far, the US has prepositioned one mechanized brigade set into Kuwait. This brigade set is located in northern Kuwait, and was activated in October, 1994. The US was able to fly in

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troops, marry them up with their prepositioned equipment, and deploy the brigade to the Kuwaiti border within two weeks.[443] The US has prepositioned most of one brigade set afloat, and is seeking the additional sealift necessary to preposition two armored and two mechanized battalions on five new RO-RO ships in the Gulf. [444]

The Marine Corps Maritime Prepositioning Force now includes three Maritime Prepositioning Squadrons, each able to support a Marine Expeditionary Force (Forward) and nearly 15,000 men for 30 days with equipment and supplies. One of these squadrons is normally deployed at Diego Garcia. The Air Force has four logistic ships, carrying supplies and ammunition, and the US Army now has two container ships which carry 30 days of supplies for the early deploying units of the entire contingency Corps.[445] The US goal is to have about 200,000 tons of heavy weapons, support equipment, and other supplies afloat in the region, and another 350,000 tons prepositioned ashore.[446]

The US has negotiated with Qatar and the UAE to prepositioning of a second and third brigade set on land. The prepositioning of a brigade set offers the US major advantages in terms of time and cost. A brigade can deploy to a prepositioned brigade set in six days at a cost of $26 million. It would take the equivalent of 28 Boeing 747 aircraft to move the soldiers and 28 C-141 flights to bring in additional equipment. In contrast, such a redeployment would cost $345 million, would take 28 days to airlift an entire brigade, and would require 679 C-141 flights and 532 C-5 flights.[447]

Strengths in US Capabilities

Force numbers and deployment speed are not the only issue which must be considered in summarizing the trends in US military capabilities. The US enjoys major qualitative advantages over most Third World forces, particularly nations like Iran and Iraq. Table VIII-6 summarizes the way in which the US exploited these advantages during the Gulf War, and most are likely to continue to give the US an important mix of “force-multipliers” in any major regional contingency in the Gulf.

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Table VIII-6

US Military Advantages in Coalition Warfare in the Gulf War

- *Decoupling of political and military responsibility:* No war is ever free of command controversy or friction between political and military leadership. However, US forces fought the Gulf War with an exceptionally effective delegation of responsibility for military decisions to military commanders. The fact that this system worked was partly a matter of individual personalities, but it also reflected important changes in the way national command authority was exercised in the US in comparison with Korea and Vietnam and from the nature of coalition command in past wars. Unfortunately, Desert Fox and Kosovo indicate this may not be a lasting feature of the US way of war.

- *Unity of command:* In spite of the formal Coalition command structure, effective unity of command took place at the level of USCINCENT. The planning and operational control of all Coalition forces, regardless of service, had a high degree of central coordination. There was no division of command by military service, or separation of operations and intelligence. National forces preserved a high degree of autonomy because they were assigned specific functions, areas, and responsibilities, but Coalition commanders supported de facto unity of command -- largely due to the support that Saudi Arabia, Britain, Egypt, and France were willing to give the US. The level of unity of command, and "fusion," achieved during the Gulf War was scarcely perfect, but it was far more functional than in previous military conflicts.

- *Creation of new air battle capabilities:* Advances in aircraft, air munitions, and C^4I/BM systems allowed the US to develop the capability to rapidly suppress Third World air and ground-based defense systems while simultaneously carrying out deep strategic and theater offensive strikes against both strategic and tactical targets. This gave the US the capability to initiate a major air campaign before the AirLand battle and before it defeated or suppressed enemy air capabilities and defenses.

- *Combined arms operations, joint operations, and the "AirLand Battle":* While US doctrine had always placed a *pro forma* emphasis on combined arms operations, many US operations in Vietnam did not properly integrate combined arms, common inter-service training in joint and combined arms operations was limited, and air operations were not properly integrated into land operations. In the years that followed, the US reorganized to place far more emphasis on combined arms and joint operations. It greatly strengthened joint operations training and career rotations into joint commands. At the same time, it developed tactics that closely integrated air and land operations into what the US came to call the "AirLand battle". These tactics were critical to the success of the ground battle.

- *Emphasis on maneuver:* The US had emphasized firepower and attrition during the end of the Vietnam War. In the years that followed, it converted its force structure to place an equal emphasis on maneuver and deception. This emphasis was supported by Britain and France, and was adopted by Saudi Arabia.

- *Emphasis on deception and strategic/tactical innovation:* No country has a monopoly on the use of deception and strategic/tactical innovation. The Coalition, however, demonstrated capabilities that were far superior to those of Iraq.

- *"24 hour war" - Superior night, all-weather, and beyond-visual-range warfare:* "Visibility" is always relative in combat. There is no such thing as a perfect night vision or all-weather combat system, or way of acquiring perfect information at long-ranges. US and British air and land forces, however, had far better training and technology for such combat than they have ever had in the past, and were the first forces designed to wage warfare continuously at night and in poor weather. Equally important, they were far more capable of taking advantage of the margin of extra range and tactical information provided by superior technology.

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- *Near Real-Time Integration of C^3I/BM/T/BDA:* The Coalition took advantage of major US C^3I/BM/T/BDA organization, technology, and software to integrate various aspects of command, control, communications, and intelligence (C^3I); battle management (BM), targeting (T), and battle damage assessment (BDA) to achieve a near real-time integration and decision-making execution cycle.

- *Integration of space warfare:* The Coalition integrated US space-based intelligence, communications, and command and control assets into its tactics and organization. This "space advantage" would have been even greater if space-based imagery had been better disseminated at the theater and tactical levels.

- *A new tempo of operations:* The Coalition exploited a superiority in every aspect of targeting, intelligence gathering and dissemination, integration of combined arms, multi-service forces, and night and all-weather warfare to achieve both a new tempo of operations and one far superior to that of Iraq.

- *A new tempo of sustainability:* The Coalition forces had maintainability, reliability, reparability, and the speed and overall mobility of logistic, service support, and combat support force activity that broadly matched their maneuver and firepower capabilities. The benefits of these new capabilities were reflected in such critical areas as the extraordinarily high operational availability and sortie rates of US aircraft, and the ability to support the movement of heliborne and armored forces during the long thrust into Iraq from the West.

- *Beyond-visual-range air combat, air defense suppression, air base attacks, and airborne C^4I/BM:* The Coalition had a decisive advantage in air combat training, in beyond-visual-range air combat capability, in anti-radiation missiles, in electronic warfare, in air base and shelter and kill capability, in stealth and unmanned long-range strike systems, in IFF and air control capability, and in airborne C^4I/BM systems like the E-3 and ABCCC. These advantages allowed the Coalition to win early and decisive air supremacy.

- *Focused and effective interdiction bombing:* While the Coalition's strategic bombing effort had limitations, most aspects of offensive air power were highly successful. The interdiction effort was successful in most respects. The Coalition organized effectively to use its deep-strike capabilities to carry out a rapid and effective pattern of focused strategic bombing where planning was sufficiently well coupled to intelligence and meaningful strategic objectives so that such strikes achieved the major military objectives that the planner set. At the same time, targeting, force allocation, and precision kill capabilities had advanced to the point where interdiction bombing and strikes were far more lethal and strategically useful than in previous conflicts.

- *Expansion of the battle field: "Deep Strike":* As part of its effort to offset the Warsaw Pact's superiority, US tactics and technology emphasized using air-strike and cruise-missile capabilities to extend the battlefield far beyond the immediate forward edge of the battle area (FEBA). The Coalition exploited the resulting mix of targeting capability, improved air-strike capabilities, and land-force capabilities in ways that played an important role in attriting Iraqi ground forces during the air phase of the war, and which helped the Coalition break through Iraqi defenses and exploit the breakthrough. This achievement is particularly striking in view of the fact that the US was not yet ready to employ some "deep strike" targeting technologies and precision strike systems designed to fight the Warsaw Pact that were still in development.

- *Technological superiority in many critical areas of weaponry:* The Coalition scarcely had a monopoly on effective weapons, but it had a critical edge in key weapons like tanks, other armored fighting vehicles, artillery systems, long-range strike systems, attack aircraft, air-defense aircraft, surface-to-air missiles, space, attack helicopters, naval systems, sensors, battle management and a host of other areas. As has been discussed in Chapter One, this superiority went far beyond the technical "edge" revealed by "weapon on weapon" comparisons. Coalition forces exploited technology in "systems" that integrated weapons into other aspects of

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force capability and into the overall force structures of the US, Britain, France, and the Saudi Air Force to a far greater degree than Iraq and most military forces in Third World states.

- *Integration of precision-guided weapons into tactics and force structures:* The Coalition exploited a decisive US technical edge in the capability of most of its precision-guided weapons over Iraq, had far more realistic training in using them, and the ability to link their employment to far superior reconnaissance and targeting capability.

- *Realistic combat training and use of technology and simulation:* The US and Britain used training methods based on realistic joint, combined arms, armored, air warfare, and AirLand training, large-scale training, and adversary training. These efforts were far superior to previous methods and were coupled to a far more realistic and demanding system for ensuring the readiness of the forces involved. Equally important, they emphasized the need for the kinds of additional training that allowed US forces to adapt to the special desert warfare conditions of Desert Storm.

- *All volunteer military/higher entry and career standards:* British, French, US, and Saudi forces were all-volunteer professional forces. They had a decisive advantage in professional standards, training levels, and merit-based promotion.[448]

- *Emphasis on forward leadership and delegation:* Virtually all of the successful Coalition forces were aggressively led from the front. Iraqi forces were led from the rear.

- *Heavy reliance on NCOs and enlisted personnel:* There was nothing new about the heavy reliance that Western forces placed on the technical skills, leadership quality, and initiative of non-commissioned officers (NCOs) and experienced enlisted personnel. This is a reliance which is common to virtually every Western military force, and which has given them a major advantage over Soviet and those Third World forces which do not give the same authority and expertise to NCOs and career enlisted personnel. Better educated, trained, and experienced NCOs and enlisted personnel were critical to the British, French, and US ability to exploit technology, and sustain high tempo operations.

- *High degree of overall readiness:* Military readiness is a difficult term to define since it involves so many aspects of force capability. Western forces entered the Gulf War, however, with two great advantages. The first was far more realistic standards for measuring readiness and ensuring proper reporting. The second was adequate funding over a sustained period of time.

It is important to note that the advantages listed in Table VIII-6 can be far less significant in dealing with unconventional warfare, politically dominated low-intensity and guerrilla conflicts, urban warfare, and other specialized types of conflict, than in direct conventional combat.

Weaknesses in US Capabilities

The US also is scarcely “ten feet tall.” The problem with words like “super power” is that the US may take them seriously and ignore the problems discussed throughout this report. Table VIII-7 presents a list of potential weaknesses and vulnerabilities in US forces that could also

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affect the outcome of a contingency in the Gulf, and which an intelligent enemy might exploit in a future conflict. The US has already encountered some of these challenges in Vietnam, Beirut, Somalia, Bosnia, Iraq, and Kosovo and it has no guarantee that it will not encounter them in future contingencies in the Gulf.

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Table VIII-7

Weaknesses in US Capabilities for Future Warfare in the Gulf

- *Accepting the true politics of war:* Much of the writing on the "revolution in military affairs" still assumes that the US will only have to use military force where there is clear popular and legislative support, and tacitly assumes that any action by the US and/or its allies will have broad international support. There are two problems with this approach. The first is that the defense of strategic interests cannot always be tied to an act of naked aggression like Iraq's invasion of Kuwait. The second is that popular, legislative, and international support is always conditional and often volatile. Beginning a conflict or peace action is only the start of the political nature of war. If the enemy can exploit the political situation, there will be no contract between the military and society that will guarantee continued support.

- *Internal security and political warfare:* The US cannot rescue any Gulf government from its own people. It may help support allied internal security forces with training and technical aid, but the US position in the Gulf is ultimately dependent on the popular support available to each Gulf regime, popular perception of that regime's legitimacy, and the extent to which each Gulf government maintains a "social contract" with its people that provides them with security, jobs, and hope for the future. Most of the Southern Gulf states -- excepting Bahrain, Oman, and the poorer sheikdoms of the UAE -- have the oil and gas wealth to maintain relatively high current standards of income, and the wealthier Gulf states have the financial ability to help the poorer states. The question is whether the Southern Gulf states will make effective use of their wealth and be able to meet the expectations of their minorities and youth (over 40% of the population of the Southern Gulf is under 15). If Gulf governments do not deal with these problems, the US will be no more able to help them against their people than it was able to help the Shah.

- *Islamic extremism*: The US is not equipped to deal with the challenge of Islamic extremism. It can address the technical aspects of counter-terrorism and security operations, but it cannot deal with the cultural, political and religious aspects of the Islamic revival, or deal at a political level with its violent and extremist elements. Iran, Iraq, or other regional threats are almost certain to attempt to exploit the secular, Western, Christian, and pro-Israeli character of the US and to attempt to discredit the Islamic character of the Southern Gulf states. Iran is certain to exploit the Shi'ite issue as well, and Iraq to exploit its Arab identity. If the US lacks regional allies which are seen as having Islamic legitimacy, there is little the US can do to deal with the resulting politico-military problems.

- *Low-intensity realism:* Low-intensity wars are almost invariably fought in confused political circumstances against people, not things. Such wars are highly political and focus on killing rather than on destroying weapons and facilities. Western preparation for using the revolution in military affairs in peace-keeping and low-intensity conflict sometimes tacitly denies this political reality, while policy makers often commit military forces on the basis of expectations of success without fully assessing the risks. While it may be argued that the West has learned from Somalia, it is not clear what or how. The current peacekeeping effort in Bosnia, for example, still presents similar risks, and a characterization of Serbian, Croatian, and Muslim forces during the crisis has scarcely been a model that can support a countervailing strategy.

- *Mountain Warfare and Warfare in Rough Terrain:* Many of the systems and tactics that the Coalition exploited in the Gulf War were only possible because of the relatively flat terrain and open nature of that terrain. They would be much less decisive if better cover was available.

- *Sudden attack:* One of the key lessons that future threats are likely to draw from Desert Storm is the potential advantage of sudden and decisive action, and the potential value of exploiting the problems in the power projection capabilities of the US and other Western military forces. US strength may often deter war, but when

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deterrence fails, it is important to understand that threat powers are likely to escalate suddenly and stress surprise. It is equally important to understand that threat nations actively exploit reporting on shifts in US defense spending and force levels, and will focus on the problems in Western power projection capabilities revealed in budget documents, legislative debates and the media.

- *Extended deterrence and battles of intimidation:* At present, the US is better prepared for war-fighting than it is in defining a clear structure of regional deterrence based on exploiting the weaknesses of threat nations, and reassuring and strengthening allies. Many crises and regional issues, however, are decided by "no intensity" conflict. They are the product of whether one nation can intimidate another, often to win limited victories that do not threaten the survival or ruling elite in neighboring states. The current Iranian build-up in the Gulf seems to have this focus. So do some aspects of North Korea's manipulation of its nuclear threat, (or threat of acquiring nuclear capability), and the Chinese build-up of capabilities that may affect decisions on control of the South China Sea. The problem the US faces in countering such pressures and in extending deterrence to a regional level is one that it is only beginning to address.

- *Ecological and environmental warfare; Water and infrastructure warfare:* The burning oil fields and oil spills of the Gulf War did not materially affect the ecology of Kuwait and the Gulf. They did, however, set a precedent for environmental warfare that may be more important in the future. There is often only a narrow line between military actions that affect the environment, and actions that affect key aspects of human survival like attacks on water facilities and power facilities that affect key human services and attacks on fuel facilities. Weapons of mass destruction are not the only way of achieving large-scale damage or high civilian casualties.

- *Limits of UN/cooperative/Coalition warfare:* While coalition warfare offers many potential advantages, it also confronts the West with the practical problem of understanding the strengths and weaknesses of potential and actual allied nations and forces, and integrating them into the "revolution in military affairs". Britain, France, and the US deployed to Saudi Arabia in Desert Storm under conditions where it took several months to realistically assess Saudi forces and begin efforts to develop more interoperable war-fighting capabilities. The fact that Egypt and Syria were reluctant to execute an offensive into Kuwait came as a surprise to USCINCENT, although this should scarcely have been a surprise in the case of Syria.

- *Weapons of mass destruction:* The Coalition emerged from Desert Storm claiming a victory over Iraq in destroying its weapons of mass destruction that it never achieved. It had firmly identified only two of 21 major Iraqi nuclear facilities before the war, struck only 8 by the time the war ended, did not properly characterize the functions of more than half the facilities it struck, and never completed effective BDA. Coalition strikes on Iraqi chemical facilities left 150,000 munitions intact -- most of which suffered far more from design defects than Coalition attacks. Iraq's biological warfare capabilities seemed to have been evacuated, and remain largely intact. The Coalition "Scud Hunt" failed and never produced a confirmed kill. Future wars are certain to present far more serious and time urgent threats, and involve far more developed planning to try to exploit possession of such weapons.

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The Problem of Asymmetric Warfare

There is no way to predict which of the weaknesses in Table VIII-7, if any, Gulf states will try to exploit in a future crisis or conflict, or how they will compare to the strengths the US can bring to bear. Nevertheless, every reaction produces an equal and opposition reaction, and it is clear that hostile states all over the world are pursuing two major options on this list. One is the use of asymmetric warfare and the other proliferation of weapons of mass destruction. As a result, it is scarcely surprising the current plans of the Department of Defense give high priority to asymmetric warfare, and to the possibility that this will involve terrorism and the use of weapons of mass destruction:[449]

> The most demanding military requirement on U.S. forces is the capability to fight and win two major theater wars in overlapping time frames. This requires that U.S. forces have a full spectrum of military capabilities in quantities sufficient to defeat any two regional adversaries in full–scale warfare involving land, sea, and aerospace forces in two separate and distant theaters of conflict, with only a short period of time separating the beginnings of the two conflicts.
>
> Major theater war presents the United States with three additional challenges. First is the ability to rapidly defeat the offensives of both adversaries well short of their objectives. Maintaining this capability is critical to the United States' ability to seize the initiative in both theaters and to minimize the amount of territory to be regained from enemy forces. Failure to rapidly defeat an enemy offensive can make the subsequent campaign to evict enemy forces from captured territory much more difficult, lengthy, and costly. It could also weaken coalition support, undermine U.S. credibility, and increase the risk of conflict elsewhere. By the same token, a force that is clearly capable of defeating aggression promptly will serve as a robust deterrent by denying would–be aggressors the prospect of success. Thus, the Department must ensure that the appropriate forces and infrastructure are ready and available to project power sufficient to rapidly defeat enemy forces in the early stages of a major conflict.
>
> A second challenge is the threat or use of chemical and biological weapons, a likely condition of future warfare, especially in the early stages of war for purposes of disrupting U.S. operations and logistics. These weapons may be delivered by ballistic missiles, cruise missiles, aircraft, special operations forces, or other means. This requires that U.S. forces continue to improve their capabilities to locate and destroy such weapons, preferably before such weapons can be used, and to defend against and manage the consequences if these weapons are used. Capability enhancements alone are not enough. Equally important is continuing to adapt U.S. doctrine, operational concepts, training, and exercises to take full account of the threat posed by chemical and biological weapons and other likely asymmetric threats. Moreover, given that the United States will most likely conduct future operations in coalition with other countries, the United States must also continue to encourage its friends and allies to train and equip their forces for effective operations in chemical and biological weapons environments.
>
> Finally, U.S. forces will transition to fighting major theater wars from a posture of global engagement—that is, from substantial levels of peacetime shaping activities overseas and potentially from multiple concurrent SSC operations. In the event of one major theater war, the United States would need to be

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extremely selective in making any additional commitments to either engagement activities or smaller–scale contingency operations. The United States would likely also choose to begin disengaging from those activities and operations not deemed to involve vital U.S. interests in order to better posture its forces to deter the possible outbreak of a second war. In the event of two such conflicts, U.S. forces would be withdrawn from peacetime engagement activities and SSC operations as quickly as possible to be readied for war. The United States was mindful of this strategy when it undertook Operation Allied Force in Kosovo the spring of 1999, and continually assessed the impact of this operation on the ability of U.S. forces to defend effectively in potential warfighting theaters. Should the United States have faced the challenge of withdrawing forces to mount two major wars in defense of U.S. vital interests elsewhere, the Department is confident that it would have been able to do so, albeit at higher levels of risk. The United States made various adjustments in its posture and plans to mitigate these risks during the Kosovo operation.

The risks associated with disengaging from a range of peacetime activities and operations in order to deploy the appropriate forces to the conflicts can also be mitigated, at least in part, by replacing withdrawing forces with an increased commitment of reserve component forces, coalition or allied forces, host nation capabilities, contractor support, or some combination thereof. Ultimately, the United States must accept a degree of risk associated with withdrawing from SSCs and engagement activities in order to reduce the greater risk it would incur if the nation failed to respond adequately to major theater wars.

…To be a truly full–spectrum force, the U.S. military must be able to defeat even the most innovative adversaries. Those who oppose the United States will increasingly rely on unconventional strategies and tactics to offset U.S. superiority in conventional forces. The Department's ability to adapt effectively to adversaries' asymmetric threats—such as information operations; nuclear, biological, or chemical weapons use; ballistic missiles; and terrorism—is critical to maintaining U.S. military preeminence into the 21st century.

… The terrorist threat has changed markedly in recent years due primarily to five factors: changing terrorist motivations; the proliferation of technologies of mass destruction; increased access to information and information technologies; a perception that the United States is not willing to accept casualties; and the accelerated centralization of vital components of the national infrastructure. As a result of these constantly changing threats, the United States must continue to improve its ability to stay ahead of terrorists' ever–expanding capabilities.

DoD's program for combating terrorism has four components: antiterrorism, counterterrorism, terrorism consequence management, and intelligence support. Antiterrorism consists of defensive measures used to reduce the vulnerability of individuals, forces, and property to terrorist acts. Counterterrorism consists of offensive measures taken to prevent, deter, and respond to terrorism. Terrorism consequence management consists of measures to mitigate the effects of a terrorist incident, including the use of a weapon of mass destruction. Intelligence support consists of the collection, analysis, and dissemination of all–source intelligence on terrorist groups and activities to protect, deter, preempt, or counter the terrorist threat to U.S. personnel, forces, critical infrastructures, and interests.

Five key DoD initiatives support its antiterrorism efforts. First, the Joint Staff Integrated Vulnerability Assessment Teams and CINC and Service Vulnerability Assessment Teams provide commanders with critical assistance to force protection programs. Second, DoD continues to improve its Antiterrorism Force Protection Training Program. This program provides antiterrorism awareness training to all DoD military and civilian personnel and their families, specialized training for Antiterrorism Force Protection Officers, pre–command training for prospective commanders, and operational level seminars for senior officers. Third, the Combating Terrorism Readiness Initiative Fund provides an important means for combatant

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> commanders to fund time–critical, emergent requirements that cannot wait for the normal budget or acquisition processes. Fourth, DoD has embarked on a major effort to provide minimum force protection standards for military construction projects. Finally, technology continues to be important in enhancing DoD's ability to counter terrorism. Key technology enablers include threat analysis and warning, explosive device detection, and early detection of weapons of mass destruction.
>
> In the area of counterterrorism, U.S. armed forces possess a tailored range of options to respond to terrorism directed at U.S. citizens, interests, and property, both domestically and overseas. DoD can employ the full range of military capabilities, including rapid–response Special Operations Forces that are specifically trained, manned, and equipped to pre–empt or resolve incidents of international terrorism. DoD also continues to refine its capabilities which have been intensively exercised with interagency counterparts.
>
> In the area of terrorism consequence management, DoD continues to work hard to deter, and when necessary, minimize the effects of a weapons of mass destruction incident. DoD has created, and is continually refining, an excellent response capability. For example, in October 1999, the United States Joint Forces Command established Joint Task Force Civil Support to assume overall responsibility for coordinating DoD's consequence management support efforts to civil authorities for weapons of mass destruction incidents within the United States, its territories, and possessions. See Chapter 7 for further information on consequence management.
>
> In the area of intelligence support, DoD recognizes the importance of timely dissemination of terrorist threat information from the Intelligence Community to the operators in the field. DoD continues to strive toward its goal of having fully coordinated joint operations and intelligence fusion cells at all levels. DoD intelligence organizations remain engaged in an aggressive, long–term collection and analytic effort designed to provide information that can better alert local commanders to potential terrorist attacks. Close working relationships with other members of the national Intelligence Community are being strengthened, and intelligence exchanges with U.S. allies have been increased.

There is nothing new about asymmetric warfare per se, or about the fact it poses a global threat. China posed a major asymmetric threat to the US in Korea by using deception, surprise, and human wave tactics. The US was decisively defeated in Vietnam by asymmetric warfare although it won virtually every conventional battle. The US was driven out of Lebanon and Somalia by such methods of warfare, and faced a major threat in Kosovo.

The Department of Defense report on the lessons of the war in Kosovo notes that, [450]

> "military ground forces in Operation Allied Force. Milosevic was unable to challenge superior allied military capabilities directly. His fielded forces were compelled to hide throughout most of the campaign, staying in caves and tunnels and under the cover of forest, village, or weather. He was forced to husband his antiaircraft missile defenses to sustain his challenge to our air campaign. Therefore, he chose to fight chiefly through asymmetric means: terror tactics and repression directed against Kosovar civilians; attempts to exploit the premium the alliance placed on minimizing civilian casualties and collateral damage; creation of enormous refugee flows to create a humanitarian crisis, including in neighboring countries; and the conduct of disinformation and propaganda campaigns.

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> "These tactics created several serious challenges for our forces, all of which we were able to overcome thanks to excellent training, leadership, equipment and motivation. Nevertheless, these challenges underscored the continued need to develop new operational concepts and capabilities to anticipate and counter similar asymmetric challenges in the future. Simply put, adversaries will use unconventional approaches to circumvent or undermine U.S. and allied strengths and exploit vulnerabilities. Milosevic illustrated very clearly his propensity for pursuing asymmetric approaches. He chose his tactics in the hope of exploiting the NATO nations' legitimate political concerns about target selection, collateral damage, and conducting military operations against enemy forces that are intentionally intermingled with civilian refugees.
>
> "In the case of refugee flow, the time-scale was so rapid and the numbers so great that it initially overwhelmed the neighboring countries, particularly the Former Yugoslav Republic of Macedonia (FYROM) and Albania. The humanitarian crisis created by Milosevic appeared to be an attempt to end NATO's operation by "cleansing" Kosovo of ethnic Albanians, overtaxing bordering nations' infrastructures, and fracturing alliance cohesion. He failed, despite all these efforts, principally because NATO adapted to the changing circumstances. One general lesson learned is that similar attempts at asymmetric challenges should be anticipated in future conflicts as well."

It is important to note that Serbia had at least some aid from Iraq in planning asymmetric operations during the Kosovo conflict, and while there have been no major uses of asymmetric warfare from within the Middle East, there are numerous other examples of a shift toward asymmetric threats. For example, Chinese military literature shows a new interest in asymmetric warfare, and Iran has shown considerable originality in using submarines, mines, unconventional forces, and anti-ship missiles to create a tailored asymmetric threat to naval movement through the lower Gulf.

As a result, the US and its allies are vulnerable to asymmetric forms of warfare in many ways:

- *Sudden or surprise attack:* Power projection is dependent on strategic warning, timely decision making, and effective mobilization and redeployment for much of its military effectiveness..
- *Saturation:* There is no precise way to determine the point at which mass, or force quantity, overcomes superior effectiveness, or force quality -- historically, efforts to emphasize mass have been far less successful than military experts predicted at the time. Even the best force, however, reaches the point where it cannot maintain its "edge" in C^4I/battle management, air combat, or maneuver warfare in the face of superior numbers or multiple threats. Further, saturation may produce a sudden catalytic collapse of effectiveness, rather than a gradual degeneration from which the Israeli Defense Force could recover. This affects forward deployment, reliance on mobilization and reliance on defensive land tactics versus preemption and "offensive defense."

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- *Collateral damage:* The US and its allies will operate under growing and even more severe constraints regarding inflicting damage on enemy civilians and civilian facilities in any but the highest levels of conflict.

- *Taking casualties:* War fighting is not measured simply in terms of whether a given side can win a battle or conflict, but how well it can absorb the damage inflicted upon it. Many powers are highly sensitive to casualties and losses. This sensitivity may limit its operational flexibility in taking risks, and in sustaining some kinds of combat if casualties become serious relative to the apparent value of the immediate objective.

- *Inflicting casualties:* Dependence on world opinion and outside support means some nations increasingly must plan to fight at least low and mid-intensity conflicts in ways that limit enemy casualties and collateral damage to its opponents, and show that Israel is actively attempting to fight a "humanitarian" style of combat.

- *Low-intensity combat:* Low-intensity conflict makes it much harder to cannot most technical advantages in combat -- because low-intensity wars are largely fought against people, not things. Low-intensity wars are also highly political. The battle for public opinion is as much a condition of victory as killing the enemy. The outcome of such a battle will be highly dependent on the specific political conditions under which it is fought, rather than RMA-like capabilities.

- *Hostage taking and terrorism:* Like low-intensity warfare, hostage-taking and terrorism present the problem that advanced technology powers cannot exploit their conventional strengths, and must fight a low-level battle primarily on the basis of infantry combat. HUMINT is more important than conventional military intelligence, and much of the fight against terrorism may take place in urban or heavily populated areas.

- *Urban and Built-Up Area Warfare:* Advanced military powers are still challenged the problem of urban warfare. They did not perform particularly well in urban warfare. Most western forces are not trained or equipped to deal with sustained urban warfare in populated areas during regional combat -- particularly when the fighting may affect large civilian populations on friendly soil.

- *Extended conflict and occupation warfare:* Not all wars can be quickly terminated, and many forms of warfare -- particularly those involving peace-keeping and peace- enforcement -- require prolonged military occupations.

- *Weapons of mass destruction:* The threat or actual use of such weapons can compensate for conventional weakness in some cases and deter military action in others.

Fortunately, asymmetric warfare is not a one-way street. For example, the US use of carbon fiber weapons against power grids in Kosovo illustrates the fact that moderate states in the Middle East and North Africa, and US and Western power projection forces, can introduce new asymmetric warfare techniques as well as radical states and extremist movements. However, it is clear that the moderate states in the region need to recognize and reduce their vulnerabilities in such forms of conflict, which include protracted conflict, urban warfare, guerrilla warfare, use of

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human shields, casualties, collateral damage, and the failure to plan effectively for conflict termination.

The US has used the word “terrorism” in so often to attack hostile movements and nations that it sometimes seems to forget that it is one more form of asymmetric warfare, and its "legitimacy” lies heavily in whether one is the user or the target. The Gulf has already been the scene of two major examples of asymmetric warfare or terrorism directed against the US, both of which may have some connection to Iran. These include the bombings of the Saudi National Guard training center in Riyadh in November 1995, the USAF barracks in Al Khobar in June 1996, and the USS Cole in October 2000. Coupled to numerous threats and attempts, and far more bloody attacks on US Embassies in Kenya, and Tanzania, it is obvious that this threat poses a continuing threat to US forces and facilities in the region, as well as to each of our allies.

At the same time, it is important to note that the overall patterns in Gulf and Middle Eastern terrorism are mixed. The US State Department counts of total international attacks by region indicates that the Middle East as whole – which includes a significant number of additional attacks in the Levant and North Africa -- has ranked fourth in the number of incidents over the last six years, after Western Europe, Latin America, and Asia. This reporting also shows a sharp decline in the number of incidents from 116 in 1994 to less than 50 in 1995-1999, and only 25 in 1999. If terrorism is measured in terms of casualties, the Middle East ranks third, after Asia and Africa, with annual peaks of as many as 1,097 casualties in 1996, and lows of 31 in 1999. The total Middle Eastern casualties during 1994-1999 were about one-third of those in Asia, and one half of those in Africa.[451]

The US State Department and US intelligence community report that these trends may change in the future, and do so with little warning. Middle Eastern terrorist groups and their state sponsors continue to plan, train for, and carry out acts of terrorism at levels comparable to those in recent years. Important international terrorist groups remained active and continued to try to mount lethal attacks. These included Usama Bin Ladin’s multinational al-Qaida organization as

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well as The Islamic Resistance Movement (HAMAS) and Palestinian Islamic Jihad (PIJ), both of which receive support from Iran.[452]

Iran and Iraq all persisted in their direct or indirect state sponsorship of terrorism, although this rarely had global effects or implications. In most cases, this support has been limited. It has mainly included providing assistance, training, or safehaven to terrorist groups opposed to the Middle East peace process. In some cases, particularly Iran, it also included targeting regime dissidents and opponents for assassination or harassment..

It is also important to note that global aspects of terrorism affect the region from outside it. Europe and the US are important sources of funding for extremist and terrorist movements inside the region. Afghanistan and Pakistan have become sanctuaries or sources of funding for movements like Usama Bin Ladin's al-Qaida, Afghanistan has also become a massive source of narcotics and narcoterrorism inside Iran.

Implications for US Policy

It is easy to oversimplify the problem of evaluating and improving US conventional military capabilities in the Gulf and issue dire warnings or exaggerated complaisance. It is equally easy to present long and detailed "shopping lists" for force improvements to correct the impact of years of funding and force cuts. In reality, however, the trends in US military capabilities in the Gulf are highly complex and are sometimes contradictory. It is also dangerous to speculate on detailed force improvement priorities without access to classified information and USCENTCOM's detailed knowledge of US contingency needs. As a result, there are significant problems in reaching any decisive conclusions about US capabilities, and whether the cup is half-empty or half-full.

It is clear that the US has many strategic and military strengths in the region, which combine with the strengths of its Southern Gulf allies:

- The lack of any major outside opponent: a legacy of the end of the Cold War.

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- The Coalition victory in the Gulf War.
- A decisive US and allied superiority in the Gulf region in many areas of deployed military technology.
- Southern Gulf allies which offer the US more support than at any time in the past, and which are capable of both aiding US rapid reinforcement and sustaining many aspects of US power.
- Relatively robust world oil export capabilities.
- Improvements in US power projection capabilities in many of the areas exposed as problems during the Gulf War -- including upgrading the strike capabilities of US fighters, improved prepositioning, improved sealift, and improved readiness and force management for US Army forces.
- A current ability to win control of the seas in the Gulf and achieve air superiority rapidly.
- UN sanctions which have destroyed most of Iraq's capability to use and produce weapons of mass destruction, coupled to half a decade in which Iraq has been cut off from major arms imports.
- An Iran that lost 40% or more of its ground force equipment in 1988, and which is still heavily dependent on US and British supplied equipment that is now worn and largely obsolete -- with ages of 15 to 25 years without MSIPs or comprehensive renovation. An impoverished Iran has also had to cut back sharply on its arms imports since the Gulf War, and so far is only making slow progress in acquiring nuclear weapons.
- Time in which to help build-up Southern Gulf forces, complete efforts to improve US power projection capabilities, and develop counterproliferation capabilities, because of the inevitable delays in any Iranian and Iraqi military build-up.

At the same time, it is equal that the US faces many military problems, ongoing regional problems, and challenges in dealing with Iran and Iraq, Southern Gulf states, and issues in dealing with the impact of declining US defense budgets of problems and future challenges in dealing with Iran and Iraq, Southern Gulf states, and the impact of declining US defense budgets:

- The probability that Iraq will remain a revanchist and authoritarian state, the possibility of a backlash against US policy, and the probability that Iraqi will break out from the UN sanctions before the year 2000.
- Growing problems with the Kurdish security zone and infighting between the Kurds of Talabani and Barzani.
- Near isolation in pursuing a policy of "dual containment" towards Iran, with little or no practical support -- even in the region -- for the economic and political isolation of Iran.

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- Problems in establishing US credibility regarding claims about the Iranian threat -- including recent US charges about Iranian deployment of chemical weapons on islands in the Gulf, the volume of Iranian arms sales, and the role of Rafsanjani and the Iranian ruling elite in terrorism.[453]

- The risk of a sudden "breakout" in Iranian or Iraqi nuclear capabilities if either state should be able to buy fissile material from the former Soviet Union or any other suppliers, or "breakout" in deploying advanced biological weapons.

- The failure of the Gulf Cooperation Council to emerge as a cohesive military alliance.

- Continuing waste and lack of integration in most Southern Gulf military purchasing efforts and the slow development of integrated air, maritime surveillance, and anti-mine capabilities.

- Tensions between the friendly Southern Gulf states: Saudi vs. Oman, Bahrain vs. Qatar, Qatar vs. Saudi, divisions in UAE, old tensions with Kuwait.

- Growing uncertainties within the Southern Gulf states regarding US forces and commitments, and the impact of US budget and force cuts on US capabilities in the Gulf.

- Growing economic and ethnic problems in many Southern Gulf states, coupled to the problem of Islamist extremism.

- A lack of full coordination with the Southern Gulf states in prepositioning US land forces equipment, and dealing with the problem of counter-terrorism.

- US attitudes and politics that exacerbate the Western tendency to confuse the Islamic revival with Islamist extremism, and make the "clash of civilizations" a self-fulfilling prophecy.

- The lack of clear force plans and contingency plans to deal with the problem of counterproliferation.

- A lack of a clear long-term US policy for dealing with energy emergencies, coupled to weak US and GCC modeling of energy vulnerabilities and trends in the Gulf region.

It is highly unlikely that the US can ever "fill the cup" by developing all of the forces and capabilities it needs to eliminate all of its military weakness and vulnerabilities. In fact, it is virtually certain that the real test of US capabilities will be the willingness to engage in an enduring struggle to keep the cup at least two-thirds full. The US certainly has the present and planned military resources to win any conventional conflict in the Gulf *if* it only faces a single major commitment in the Gulf, particularly if it receives continuing support from its Southern Gulf allies.

There is, however, a clear need to look in detail at the weaknesses in US forces and power projection capabilities for war fighting in the Gulf, and to reexamine the options for force

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improvements in ways which are not bound by the limits of the fiscal guidance used in recent budgets or the new Quadrennial Defense review underway in 2000. What is needed is a major net assessment and programming exercise by USCENTCOM, the command with real expertise in the region, and which can be done without the awkward bureaucratic trade-offs and compromises that seem to characterize such efforts by the Joint Staff. The problems in US capabilities are not failures in strategy, tactics, and technology, or in developing an effective engagement strategy to deal with our allies. They are problems in priorities and resources and determining what is need with the proper expertise.[454]

At some point, the President, the Congress, and the American people must also decide whether they are willing to spend what it takes to maintain the present commitment and superpower status of the US. The US strategic debate often concentrates on the search for new strategies, new technologies and new force mixes that can somehow allow the US to do more militarily with less manpower, fewer forces, and smaller defense budgets. There is good reason to suspect, however, that such a search for new ways to do more and more with less and less is largely illusory. The last quarter century has been filled with attempts to make the US defense establishment more efficient, and none have changed the basic ratio of the cost of US military capabilities relative to US military commitments. Ultimately, the choice may boil down to one of whether the US is willing to devote at least 3% of its GNP, or around $350 to $400 billion a year, to maintain its military forces. At least in the mid term, the US is unlikely to be able to spend less without accepting growing military risks in the Gulf and the rest of the world.

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IX. Proliferation is the Most Dangerous Military Threat

The threat of proliferation not only poses the greatest military challenge to the security of the region, it poses the greatest challenge to US military capabilities to deter and win a conflict in the region without unacceptable losses to our allies and damage to the global economy. As has been discussed earlier, both Iran and Iraq have actively sought and acquired biological, chemical, and nuclear weapons. Both have obtained long-range missiles, and Iran is developing a booster that could be used to launch a warhead against the US. Both used chemical weapons against each other in the Iran-Iraq War. While the UN victory in the Gulf War has severely limited Iraq's biological and chemical warfare capabilities, it has not affected Iran's programs. The US also faces the mid to long-term prospect that Iraq will recover its capability to use weapons of mass destruction in a post-sanctions environment. There is a significant risk that both Iran and Iraq will become nuclear powers and/or acquire biological weapons with the lethality of nuclear weapons.

The issues involved are not simple. The tables that describe Iran and Iraq's efforts in the chapter show both the historical momentum behind each nation's effort and its complexity. Both nations have simultaneously pursued chemical, biological, nuclear and possibly radiological weapons, for more than two decades. Both nations have extensive missile technology, but can also use aircraft cover delivery methods, or asymmetric warfare.

The analysis of Iranian and Iraqi contingency options has already shown that even if the current intentions of each leadership elite were known, they could change suddenly. A particular crisis could reshape Iran and Iraq's perceptions with little or no warning and radically change the willingness to escalate. What may start out as an act of intimidation may suddenly escalate to full-scale war.

Both nations are developing extremely lethal weapons with little capability and opportunity to test their reliability, lethality and damage effects. Both have poor targeting

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capability and delivery systems that can be highly inaccurate and unreliable. Both nations have limited command and control and battle management capabilities and have badly miscalculated the intentions and capabilities of their neighbors and the US in the past. Both have little battle damage assessment capability, not only to measure the effects of their own strikes, but the exact nature of strikes against them. They may begin a war prudently and carefully, but the fog of war could make them blunder up the escalation ladder.

Proliferation is also a regional problem. Iran and Iraq may see each other as the primary threat and the US or their Southern Gulf neighbors as the nations they want most to intimidate. India and Pakistan are on their doorsteps, however, and Iran's relations with Pakistan are poor.

Saudi Arabia has long range missiles of its own. They are obsolete Chinese-supplied weapons armed with a high explosive warhead. If Saudi Arabia is pushed too far, however, it may purchase much more advance long-ranged missiles and there are some reports it has already investigated the possibility of buying nuclear weapons from Pakistan.

Iraq has already launched missiles at Israel, and both Iran and Iraq have shown their interest in missiles with ranges that can reach targets anywhere in Israel, and have some capability to strike Israel today. In the future, longer range missiles might be used to intimidate or strike at Egypt, Turkey, or Western Europe. The only rules that matter are the ones history will make.

Iranian Force Developments

Experts differ over the seriousness of the Iranian threat. Most experts believe, however, that Iran continues to pursue the development of long-range missiles, and of nuclear and biological warheads, and has significant stocks of chemical weapons. The question is not whether Iran can proliferate, but rather at what rate and what intensity. The details of Iran's effort to proliferate are described in detail in Table IX-1, and it is clear that Iran has a long history of efforts to acquire very long-range missile technology that can be used in designing ICBMs as well as efforts to acquire weapons of mass destruction. It is also clear that efforts to downplay or

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minimize the Iranian threat have to ignore a wide range of historical evidence that Iran has evolved a sophisticated program involving major efforts at deception and using dual-use technology.

The Problem of Iranian "Moderation" and Intentions

Much will depend heavily on whether President Khatami and the more moderate elements in Iran's leadership can consolidate power and rein in Iran's hard-line extremists, as well as on Iran's perception of the threat the US poses once it is ready to deploy and the cost of that deployment. This creates an extremely uncertain political climate. On the one hand, one must be careful about either assuming that Iran's "moderates" will win, or that "moderation" will mean that Iran will not continue to proliferate.

On the other hand, one must be equally careful about assuming that Iran's hostility to Iraq and Israel, and concern with Pakistan, will be translated into the deployment of ICBM forces capable of delivering nuclear or biological weapons against the American homeland. Most of Iran's most visible missile and weapons of mass destruction programs are now directed at regional threats like Iraq, and at achieving regional influence. Iran cannot ignore the fact that India and Pakistan are becoming nuclear powers with missiles that can strike at any target in the region.

Status is also an issue. Even a "moderate" Iranian regime may conclude that proliferation is the only way to give Iran political and strategic credibility as a major power in the region and to offset US power projection capabilities and the strength of any US-Southern Gulf coalition. The more hostile elements in the Iranian regime may also have concluded that some kind of threat to the American Homeland will give it critical leverage in limiting US freedom of action in the region. Even a future neutral or "friendly" regime might conclude that the possession of strong regional strike capabilities with long-range missiles and weapons of mass destruction, could hold US power projection forces, bases, and allied territory as hostages in the region, and that developing a limit strike capability against the US would help deter any US strikes on such a regional capability.

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The practical problem is that the US cannot possibly predict the character of an Iranian regime over the next 10-25 years, nor can it predict that Iranian regimes will share the risk perceptions of the US or act as "rational bargainers" from an American perspective. This means there is no way to predict what kind of threat Iran may or may not develop against the US homeland.

Iranian Missile Developments

What is clear from Table IX-1, is that Iran is *currently* developing the missile production capabilities and technology, and weapons of mass destruction, that *could* eventually allow it to deploy a threat to the US. In September 1999, National Intelligence Council summarized the potential Iranian ballistic missile threat to the US as follows:[455]

> "Iran is the next hostile country most capable of testing an ICBM capable of delivering a weapon to the United States during the next 15 years. [456]
>
> - Iran *could test* an ICBM that could deliver a several-hundred kilogram payload to many parts of the United States in the latter half of the next decade, using Russian technology and assistance.
>
> - Iran *could pursue* a Taepo Dong-type ICBM. Most analysts believe it could test a three-stage ICBM patterned after the Taepo Dong-1 SLV or a three-stage Taepo Dong-2-type ICBM, possibly with North Korean assistance, in the next few years.
>
> - Iran is *likely to test* an SLV by 2010 that—once developed—could be converted into an ICBM capable of delivering a several-hundred kilogram payload to the United States.
>
> - Analysts differ on the likely timing of Iran's first flight test of an ICBM that could threaten the United States. Assessments include:
>
> —*likely* before 2010 and *very likely* before 2015 (noting that an SLV with ICBM capabilities will *probably be tested within the next few years)*;
>
> —no more than an *even chance* by 2010 and a *better than even chance* by 2015;
>
> —and *less than an even chance* by 2015."

The NIC also estimated that Iran, as well as other advanced proliferators, will be able to deploy warheads with some degree of penetration aids by the time it can deploy missiles capable of reaching the US. [457]

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"We assess that countries developing ballistic missiles would also develop various responses to US theater and national defenses. Russia and China each have developed numerous countermeasures and probably are willing to sell the requisite technologies.

- Many countries, such as North Korea, Iran, and Iraq probably would rely initially on readily available technology—including separating RVs, spin-stabilized RVs, RV reorientation, radar absorbing material (RAM), booster fragmentation, low-power jammers, chaff, and simple (balloon) decoys—to develop penetration aids and countermeasures.

- These countries could develop countermeasures based on these technologies by the time they flight test their missiles.

Foreign espionage and other collection efforts are likely to increase. China, for example, has been able to obtain significant nuclear weapons information from espionage, contact with scientists from the United States and other countries, publications and conferences, unauthorized media disclosures, and declassified US weapons information. We assess that China, Iran, and others are targeting US missile information as well."

These conclusions regarding penetration aids are not mentioned in many unclassified studies of the missile threat to the US, and the unclassified discussions of the nominal program architecture for the National Missile Defense system. They do, however, raise important questions about whether a single site with a limited number of interceptors and the current configuration can provide highly reliable coverage against the kind of Iranian threat that might develop by 2010-2020.

The US intelligence community is divided whether Iran will sustain its current programs, and actually deploy a system capable of striking the US. A number of US intelligence officials feel the NIC report was politicized by pressure from the policy level to support the NMD program, and to not disagree with the results of the Rumsfeld Commission. They feel that Iran still faces problems in in its program to build the Shahab-3, which some feel is a missile with a range of only 780 miles. At least one official has been quoted on backround as stating that, "There is an Iranian threat to U.S. forces in the region, not to the continental United States."

Nevertheless, Iran announced on July 15, 2000 that it had successfully test-fired an upgraded version of its medium-range Shahab missile. An Iranian defence ministry source was quoted by state media as saying that the missile was test-fired to ensure it conforms to the latest technological standards. It was first tested in 1998. ``This missile is part of our program for the

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defence industry and it would in no way threaten other countries." The Iranian announcement stated that that the Shahab-3 was a ballistic missile, with a range of 800 miles, and could travel at a speed of 4,320 mph with a 1-ton warhead.

US experts indicated that they estimated the missile had a range of 1,300 km (800 miles), making it capable of hitting Israel, and that the Shahab-3 was modeled mainly on North Korea's Nodong-1, but has been improved with Russian technology. Iran's Defence Minister Admiral Ali Shamkhani has said a larger missile, Shahab 4, was in production as a vehicle for launching satellites into space.[458] US officials agree that Iran is considering developing a rocket that can put satellites in orbit, but note that the development of such a booster would give Iran significantly enhanced capabilities to develop an intercontinental ballistic missile.[459] U.S. Defence Department spokesman Ken Bacon stated that,. "From everything we can tell, it was a successful firing. It is another sign they are determined to build longer-range weapons of mass destruction."[460]

Secretary of Defense William Cohen stated that, [461]

> ``This does not come as a surprise…I have pointed to Iran and the testing of the Shahab-3 and what I assume will be the testing of the 4 in the future and beyond that, as one of the reasons why it is important for the United States to undertake to research, develop and potentially deploy an NMD (national missile defense) system that would provide protection against countries such as Iran posing a threat to the United States…This represents a continuation of their testing program, whether it was scheduled to coincide with the discussions in Washington is a matter only the Iranians can determine, we don't have any information pertaining to that.,. We accept it for what it is, we know that they will continue to test it, they will continue to develop a longer-range missile capability and that is one of the reasons why we believe it is important that the United States continue its research and testing and the development program for the NMD, precisely to deal with countries such as North Korea, Iran, Iraq and others. Anytime you have success in a particular missile system, that gives you confidence to move forward with more tests, with greater capability…So I think there is obviously a potential to accelerate development with each successful test…we have discussed this in the past, we believe that North Korea, Iran, potentially Iraq in the future and others will develop long-range missile capability. This is what we anticipate, this confirms our anticipation, and so this is a factor that will have to be taken into account in terms of what the time frame will be when Iran will have the capability of striking U.S. territory or that of European nations….Only the president can decide whether we should go forward at this point," Cohen said. ``But I think this is an issue that is not going to go away with the elections, and if there is any delay in the program, that another president will have to face it at some point because the threat will continue to expand. "

Israel expressed its concerns as well. Amos Yaron, director-general of the Defence Ministry, told Israel Radio that, "We are looking at this matter for the moment with some concern

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because in any event they have the ability. We don't believe they have any intention whatsoever to attack the state of Israel for the moment… It must be remembered that Iran developed these capabilities as a result of the lessons they had from the wars of the past, which is to say from its big war against Iraq. Iran didn't develop this missile against the state of Israel…Now the Iranians have this ability. Between the ability and the intention, there is a great distance." A senior Israeli military source did predict, however, that by 2005, Iran would, with Russian help, achieve a military nuclear capability. Israel's army chief, Lieutenant-General Shaul Mofaz, told Israel Radio that the combined development of the missile and a non-conventional capacity posed a threat not only to Israel, but also to any country within range of the missile.[462]

Iran's foreign minister Kamal Kharraz responded by stating that, "as it was announced before, the test was done to boost the country's defensive capability and as a deterring force. It looks like America and Israel are using Iran's efforts to boost its defensive capability, which are its natural and legitimate right, as a scapegoat to secure the budget to race for arms…Who says Israel has the right to be equipped with all kinds of offensive arms, including weapons of mass destruction, but other countries in the region should not even have defensive weapons? The propaganda against Iran is aimed at deflecting world concerns over the U.S. missile shield."[463]

Iran and Weapons of Mass Destruction

The chain of evidence surrounding Iran's overall efforts to acquire weapons of mass destruction is both uncertain and complex. It too is summarized in Table IX-2, however, and there is substantial evidence that Iran could be acquiring a nuclear and that it is also making substantial progress in deploying highly lethal biological weapons.

A CIA report, issued in August 2000, summarized the state of proliferation in Iran as follows,[464]

> Iran remains one of the most active countries seeking to acquire WMD and ACW technology from abroad. In doing so, Tehran is attempting to develop an indigenous capability to produce various types of weapons—nuclear, chemical, and biological—and their delivery systems. During the reporting period, the evidence

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indicates increased reflections of Iranian efforts to acquire WMD- and ACW- related equipment, materials, and technology primarily on entities in Russia, China, North Korea and Western Europe.

For the second half of 1999, entities in Russia, North Korea, and China continued to supply the largest amount of ballistic missile-related goods, technology, and expertise to Iran. Tehran is using this assistance to support current production programs and to achieve its goal of becoming self-sufficient in the production of ballistic missiles. Iran already is producing Scud short-range ballistic missiles (SRBMs) and has built and publicly displayed prototypes for the Shahab-3 medium-range ballistic missile (MRBM), which had its initial flight test in July 1998. In addition, Iran's Defense Minister last year publicly acknowledged the development of the Shahab-4, originally calling it a more capable ballistic missile than the Shahab-3, but later categorizing it as solely a space launch vehicle with no military applications. Iran's Defense Minister also has publicly mentioned plans for a "Shahab 5." Such statements, made against the backdrop of sustained cooperation with Russian, North Korean, and Chinese entities, strongly suggest that Tehran intends to develop a longer-range ballistic missile capability in the near future.

For the reporting period, Tehran expanded its efforts to seek considerable dual-use biotechnical materials, equipment, and expertise from abroad—primarily from entities in Russia and Western Europe—ostensibly for civilian uses. Iran began a biological warfare (BW) program during the Iran-Iraq war, and it may have some limited capability for BW deployment. Outside assistance is both important and difficult to prevent, given the dual-use nature of the materials, the equipment being sought, and the many legitimate end uses for these items.

Iran, a Chemical Weapons Convention (CWC) party, already has manufactured and stockpiled chemical weapons, including blister, blood, and choking agents and the bombs and artillery shells for delivering them. During the second half of 1999, Tehran continued to seek production technology, training, expertise, and chemicals that could be used as precursor agents in its chemical warfare (CW) program from entities in Russia and China. It also acquired or attempted to acquire indirectly through intermediaries in other countries equipment and material that could be used to create a more advanced and self-sufficient CW infrastructure.

Iran sought nuclear-related equipment, material, and technical expertise from a variety of sources, especially in Russia, during the second half of 1999. Work continues on the construction of a 1,000-megawatt nuclear power reactor in Bushehr, Iran, that will be subject to International Atomic Energy Agency (IAEA) safeguards. In addition, Russian entities continued to interact with Iranian research centers on various activities. These projects will help Iran augment its nuclear technology infrastructure, which in turn would be useful in supporting nuclear weapons research and development. The expertise and technology gained, along with the commercial channels and contacts established—even from cooperation that appears strictly civilian in nature—could be used to advance Iran's nuclear weapons research and developmental program.

Beginning in January 1998, the Russian Government took a number of steps to increase its oversight of entities involved in dealings with Iran and other states of proliferation concern. In 1999, it pushed a new export control law through the Duma. Russian firms, however, faced economic pressures to circumvent these controls and did so in some cases. The Russian Government, moreover, failed in some cases regarding Iran to enforce its export controls. Following repeated warnings, the US Government in January 1998 and January 1999 imposed administrative measures against Russian entities that had engaged in nuclear- and missile-related cooperation with Iran. The measures imposed on these and other Russian entities (which were penalized in 1998) remain in effect, although sanctions against two entities—Polyus and Inor—are being lifted.

China pledged in October 1997 not to engage in any new nuclear cooperation with Iran but said it would complete cooperation on two ongoing nuclear projects, a small research reactor and a zirconium production

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facility at Esfahan that Iran will use to produce cladding for reactor fuel. The pledge appears to be holding. As a party to the Nuclear Nonproliferation Treaty (NPT), Iran is required to apply IAEA safeguards to nuclear fuel, but safeguards are not required for the zirconium plant or its products.

Iran claims that it is attempting to establish a complete nuclear fuel cycle for its civilian energy program. In that guise, it seeks to obtain whole facilities, such as a uranium conversion facility, that, in fact, could be used in any number of ways in support of efforts to produce fissile material needed for a nuclear weapon. Despite international efforts to curtail the flow of critical technologies and equipment, Tehran continues to seek fissile material and technology for weapons development and has set up an elaborate system of military and civilian organizations to support its effort.

On the ACW side, Iran (which has acknowledged a need for Western military equipment and spare parts) continues to acquire Western equipment, such as attack helicopters, but also is developing indigenous production capabilities with assistance from countries such as Russia, China, and North Korea. Indigenous efforts involve such systems as tanks, TOW missiles, fighter aircraft, Chinese-designed SAMs and anti-ship missiles, and attack helicopters.

…Russian entities (have) continued to supply a variety of ballistic missile-related goods and technical know-how to countries such as Iran, India, and Libya. Iran's earlier success in gaining technology and materials from Russian entities accelerated Iranian development of the Shahab-3 MRBM, which was first flight-tested in July 1998. Russian entities during the second six months of 1999 have provided substantial missile-related technology, training, and expertise to Iran that almost certainly will continue to accelerate Iranian efforts to develop new ballistic missile systems.

During the second half of 1999, Russia also remained a key supplier for civilian nuclear programs in Iran, primarily focused on the Bushehr Nuclear Power Plant project. With respect to Iran's nuclear infrastructure, Russian assistance enhances Iran's ability to support a nuclear weapons development effort. By its very nature, even the transfer of civilian technology may be of use in Iran's nuclear weapons program. We remain concerned that Tehran is seeking more than a buildup of its civilian infrastructure, and the IC will be closely monitoring the relationship with Moscow for any direct assistance in support of a military program. In addition, Russia supplied India with material for its civilian nuclear program during this reporting period.

Russian entities remain a significant source of biotechnology and chemicals for Iran. Russia's world-leading expertise in biological and chemical weapons would make it an attractive target for Iranians seeking technical information and training on BW and CW agent production processes. Russia (along with its sister republics in the FSU) also remains an important source of conventional weapons and spare parts for Iran, which is seeking to upgrade and replace its existing conventional weapons inventories.

Following intense and continuing engagement with the US, Russian officials took some positive steps to strengthen the legal basis of export controls. President Yeltsin in July 1999 signed a federal export control law, which formally makes WMD-related transfers a violation of law and codifies several existing decrees—including catch-all controls—yet may lessen punishment for violators. Russian export enforcement and prosecution still remains weak, however. The export law is still awaiting completion of implementing decrees and its legal status is unclear. Public comments by the head of Russia's security council indicate that Russia obtained only three convictions for export control violations involving WMD and missile technology during 1998-99.

Nonetheless, the Russian government's commitment, willingness, and ability to curb proliferation-related transfers remain uncertain. Moreover, economic conditions in Russia continued to deteriorate, putting more pressure on Russian entities to circumvent export controls. Despite some examples of restraint, Russian

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> businesses continue to be major suppliers of WMD equipment, materials, and technology to Iran. Specifically, Russia continues to provide Iran with nuclear technology that could be applied to Iran's weapons program. Monitoring Russian proliferation behavior, therefore, will remain a very high priority.
>
> Throughout the second half of 1999, North Korea continued to export significant ballistic missile-related equipment and missile components, materials, and technical expertise to countries in the Middle East, South Asia, and North Africa. Pyongyang attaches a high priority to the development and sale of ballistic missiles, equipment, and related technology. Exports of ballistic missiles and related technology are one of the North's major sources of hard currency, which fuel continued missile development and production.
>
> …Chinese missile-related technical assistance to Pakistan increased during this reporting period. In addition, firms in China provided missile-related items, raw materials, and/or assistance to several countries of proliferation concern—such as Iran, North Korea, and Libya.…China's 1997 pledge not to engage in any new nuclear cooperation with Iran has apparently held, but work associated with two remaining nuclear projects—a small research reactor and a zirconium production facility—continues. The Intelligence Community will continue to monitor carefully Chinese nuclear cooperation with Iran.
>
> Prior to the reporting period, Chinese firms had supplied CW-related production equipment and technology to Iran. The US sanctions imposed in May 1997 on seven Chinese entities for knowingly and materially contributing to Iran's CW program remain in effect. Evidence during the current reporting period suggests Iran continues to seek such assistance from Chinese entities, but it is unclear to what extent these efforts have succeeded. In June 1998, China announced that it had expanded its chemical export controls to include 10 of the 20 Australia Group chemicals not listed on the CWC schedules.

These comments broaden proliferation in the Gulf into a regional problem. They show that existing international arms control efforts are not adequate and that US and other attempts to control the sale of military and duel-USC technology have severe limits. Once again, these points are reinforced by the details shown in Table IX-1.

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Table IX-1

Iranian Missile Threats and Proliferation

Delivery Systems

- Air delivery systems include:
  - Su-24 long-range strike fighters with range-payloads roughly equivalent to US F-111 and superior to older Soviet medium bombers.
  - F-4D/E fighter bombers with capability to carry extensive payloads to ranges of 450 miles.
  - Can modify HY-2 Silkworm missiles and SA-2 surface-to-air missiles to deliver weapons of mass destruction.
- Iran has made several indigenous-long range rockets.
  - The Iran-130, or Nazeat, since the end of the Iran-Iraq War. The full details of this system remain unclear, but it seems to use commercially available components, a solid fuel rocket, and a simple inertial guidance system to reach ranges of about 90-120 kilometers. It is 355-mm in diameter, 5.9 meters long, weighs 950 kilograms, and has a 150 kilogram warhead. It seems to have poor reliability and accuracy, and its payload only seems to be several hundred kilograms.
  - The Shahin 2. It too has a 355-mm diameter, but is only 3.87 meters long, and weighs only 580 kilograms. It evidently can be equipped with three types of warheads: A 180 kilogram high explosive warhead, another warhead using high explosive submunitions, and a warhead that uses chemical weapons.
  - Iranian Oghab (Eagle) rocket with 40+ kilometers range.
  - New SSM with 125 mile range may be in production, but could be modified FROG.
- Large numbers of multiple rocket launchers and tube artillery for short range delivery of chemical weapons.
- Iran has shorter missile range systems:
  - In 1990, Iran bought CSS-8 surface-to-surface missiles (converted SA-2s) from China with ranges of 130-150 kilometers.
  - Has Chinese sea and land-based anti-ship cruise missiles. Iran fired 10 such missiles at Kuwait during Iran-Iraq War, hitting one US-flagged tanker.
- The Soviet-designed Scud B (17E) guided missile currently forms the core of Iran’s ballistic missile forces.
  - Iran acquired its Scuds in response to Iraq’s invasion. It obtained a limited number from Libya and then obtained larger numbers from North Korea. It deployed these units with a special Khatam ol-Anbya force attached to the air element of the Pasdaran. Iran fired its first Scuds in March, 1985. It fired as many as 14 Scuds in 1985, 8 in 1986, 18 in 1987, and 77 in 1988. Iran fired 77 Scud missiles during a 52 day period in 1988, during what came to be known as the "war of the cites." Sixty-one were fired at Baghdad, nine at Mosul, five at Kirkuk, one at Takrit, and one at Kuwait. Iran fired as many as five missiles on a single day, and once fired three missiles within 30 minutes. This still, however, worked out to an average of only about one missile a day, and Iran was down to only 10-20 Scuds when the war of the cities ended.
  - Iran's missile attacks were initially more effective than Iraq's attacks. This was largely a matter of geography. Many of Iraq's major cities were comparatively close to its border with Iran, but Tehran and most of Iran's major cities that had not already been targets in the war were outside the range of Iraqi Scud attacks. Iran's missiles, in contrast, could hit key Iraqi cities like Baghdad. This advantage ended when Iraq deployed extended range Scuds.
  - The Scud B is a relatively old Soviet design which first became operational in 1967, designated as the R-17E or R-300E. The Scud B has a range of 290-300 kilometers with its normal conventional payload. The export version of the missile is about 11 meters long, 85-90 centimeters in diameter, and weighs 6,300 kilograms. It has a nominal CEP of

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1,000 meters. The Russian versions can be equipped with conventional high explosive, fuel air explosive, runway penetrator, submunition, chemical, and nuclear warheads.

- The export version of the Scud B comes with a conventional high explosive warhead weighing about 1,000 kilograms, of which 800 kilograms are the high explosive payload and 200 are the warhead structure and fusing system. It has a single stage storable liquid rocket engine and is usually deployed on the MAZ-543 eight wheel transporter-erector-launcher (TEL). It has a strap-down inertial guidance, using three gyros to correct its ballistic trajectory, and uses internal graphite jet vane steering. The warhead hits at a velocity above Mach 1.5.
- Most estimates indicate that Iran now has 6-12 Scud launchers and up to 200 Scud B (R-17E) missiles with 230-310 KM range.
- Some estimates give higher figures. They estimate Iran bought 200-300 Scud Bs from North Korea between 1987 and 1992, and may have continued to buy such missiles after that time. Israeli experts estimate that Iran had at least 250-300 Scud B missiles, and at least 8-15 launchers on hand in 1997.
- US experts also believe that Iran can now manufacture virtually all of the Scud B, with the possible exception of the most sophisticated components of its guidance system and rocket motors. This makes it difficult to estimate how many missiles Iran has in inventory and can acquire over time, as well as to estimate the precise performance characteristics of Iran's missiles, since it can alter the weight of the warhead and adjust the burn time and improve the efficiency of the rocket motors

- Iran has new long range North Korean Scuds - with ranges near 500 kilometers.
  - The North Korean missile system is often referred to as a "Scud C." Typically, Iran formally denied the fact it had such systems long after the transfer of these missiles became a reality. Hassan Taherian, an Iranian foreign ministry official, stated in February, 1995, "There is no missile cooperation between Iran and North Korea whatsoever. We deny this."
  - In fact, a senior North Korean delegation traveled to Tehran to close the deal on November 29, 1990, and met with Mohsen Rezaei, the former commander of the IRGC. Iran either bought the missile then, or placed its order shortly thereafter. North Korea then exported the missile through its Lyongaksan Import Corporation. Iran imported some of these North Korean missile assemblies using its B-747s, and seems to have used ships to import others.
  - Iran probably had more than 60 of the longer range North Korean missiles by 1998, although other sources report 100, and one source reports 170.
  - Iran may have 5-10 Scud C launchers, each with several missiles. This total seems likely to include four new North Korean TELs received in 1995.
  - Iran seems to want enough missiles and launchers to make its missile force highly dispersible.
  - Iran has begun to test its new North Korean missiles. There are reports it has fired them from mobile launchers at a test site near Qom about 310 miles (500 kilometers) to a target area south of Shahroud. There are also reports that units equipped with such missiles have been deployed as part of Iranian exercises like the Saeqer-3 (Thunderbolt 3) exercise in late October, 1993.
  - The missile is more advanced than the Scud B, although many aspects of its performance are unclear. North Korea seems to have completed development of the missile in 1987, after obtaining technical support from the People's Republic of China. While it is often called a "Scud C," it seems to differ substantially in detail from the original Soviet Scud B. It seems to be based more on the Chinese-made DF-61 than on a direct copy of the Soviet weapon.
  - Experts estimate that the North Korean missiles have a range of around 310 miles (500 kilometers), a warhead with a high explosive payload of 700 kilograms, and relatively good accuracy and reliability. While this payload is a bit limited for the effective delivery of chemical agents, Iran might modify the warhead to increase payload at the expense of range and restrict the using of chemical munitions to the most lethal agents such as persistent nerve gas. It might also concentrate its development efforts on arming its Scud C forces with more lethal biological agents. In any case, such missiles are likely to have enough range-payload to give Iran the ability to strike all targets on the southern coast of the Gulf and all of the populated areas in Iraq, although not the West. Iran could also reach targets in part of eastern Syria, the eastern third of Turkey, and cover targets in the border area of the former Soviet Union, western Afghanistan, and western Pakistan.

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  - Accuracy and reliability remain major uncertainties, as does operational CEP. Much would also depend on the precise level of technology Iran deployed in the warhead. Neither Russia nor the People's Republic of China seem to have transferred the warhead technology for biological and chemical weapons to Iran or Iraq when they sold them the Scud B missile and CSS-8. However, North Korea may have sold Iran such technology as part of the Scud C sale. If it did so, such a technology transfer would save Iran years of development and testing in obtaining highly lethal biological and chemical warheads. In fact, Iran would probably be able to deploy far more effective biological and chemical warheads than Iraq had at the time of the Gulf War.
  - Iran may be working with Syria in such development efforts, although Middle Eastern nations rarely cooperate in such sensitive areas. Iran served as a transshipment point for North Korean missile deliveries during 1992 and 1993. Some of this transshipment took place using the same Iranian B-747s that brought missile parts to Iran. Others moved by sea. For example, a North Korean vessel called the *Des Hung Ho*, bringing missile parts for Syria, docked at Bandar Abbas in May, 1992. Iran then flew these parts to Syria. An Iranian ship coming from North Korea and a second North Korean ship followed, carrying missiles and machine tools for both Syria and Iran. At least 20 of the North Korean missiles have gone to Syria from Iran, and production equipment seems to have been transferred to Iran and to Syrian plants near Hama and Aleppo.
- Iran has created shelters and tunnels in its coastal areas which it could use to store Scud and other missiles in hardened sites and reduce their vulnerability to air attack.
- Iran can now assemble Scud and Scud C missiles using foreign-made components. It may soon be able to make entire missile systems and warhead packages in Iran.
- A US examination of Iran’s dispersal, sheltering, and hardening programs for its anti-ship missiles and other missile systems indicate that Iran has developed effective programs to ensure that they would survive a limited number of air strikes and that Iran had reason to believe that the limited number of preemptive strikes Israel could conduct against targets in the lower Gulf could not be effective in denying Iran the capability to deploy its missiles.
- Iran is developing an indigenous missile production capability with both solid and liquid fueled missiles.
  - The present scale of Iran’s production and assembly efforts is unclear. Iran seems to have a design center, at least two rocket and missile assembly plants, a missile test range and monitoring complex, and a wide range of smaller design and refit facilities.
  - The design center is said to located at the Defense Technology and Science Research Center, which is a branch of Iran’s Defense Industry Organization, and located outside Karaj -- near Tehran. This center directs a number of other research efforts. Some experts believe it has support from Russian and Chinese scientists.
  - Iran’s largest missile assembly and production plant is said to be a North Korean-built facility near Isfahan, although this plant may use Chinese equipment and technology. There are no confirmations of these reports, but this region is the center of much of Iran's advanced defense industry, including plants for munitions, tank overhaul, and helicopter and fixed wing aircraft maintenance. Some reports say the local industrial complex can produce liquid fuels and missile parts from a local steel mill.
  - A second missile plant is said to be located 175 kilometers east of Tehran, near Semnan. Some sources indicate this plant is Chinese-built and began rocket production as early as 1987. It is supposed to be able to build 600-1,000 Oghab rockets per year, if Iran can import key ingredients for solid fuel motors like ammonium perchlorate. The plant is also supposed to produce the Iran-130.
  - Another facility may exist near Bandar Abbas for the assembly of the Seersucker. China is said to have built this facility in 1987, and is believed to be helping the naval branch of the Guards to modify the Seersucker to extend its range to 400 kilometers. It is possible that China is also helping Iran develop solid fuel rocket motors and produce or assemble missiles like the CS-801 and CS-802. There have, however, been reports that Iran is developing extended range Scuds with the support of Russian experts, and of a missile called the Tondar 68, with a range of 700 kilometers.
  - Still other reports claim that Iran has split its manufacturing facilities into plants near Pairzan, Seman, Shiraz, Maghdad, and Islaker. These reports indicate that the companies involved in building the Scuds are also involved in Iran’s production of poison gas and include Defense Industries, Shahid, Bagheri Industrial Group, and Shahid Hemat Industrial Group.

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- Iran's main missile test range is said to be further east, near Shahroud, along the Tehran-Mashhad railway. A telemetry station is supposed to be 350 kilometers to the south at Taba, along the Mashhad-Isfahan road. All of these facilities are reportedly under the control of the Islamic Revolutionary Guards Corps.
- There were many reports during the late 1980s and early 1990s that Iran had ordered the North Korean No Dong missile, which was planned to have the capability to carry nuclear and biological missile ranges of up to 900 kilometers. This range would allow the missile could reach virtually any target in Gulf, Turkey, and Israel. The status of the No Dong program has since become increasingly uncertain, although North Korea deployed some developmental types at test facilities in 1997.
    - The No-Dong underwent flight tests at ranges of 310 miles (500 kilometers) on May 29, 1993. Some sources indicate that Iranians were present at these tests. Extensive further propulsion tests began in August 1994, and some reports indicate operational training began for test crews in May 1995. Missile storage facilities began to be built in July 1995, and four launch sites were completed in October 1995.
    - The progress of the program has been slow since that time, and may reflect development problems. However, mobile launchers were seen deployed in northeast North Korea on March 24, 1997. According to some reports, a further seven launcher units were seen at a facility about 100 kilometers from Pyongyang.
    - The No-Dong 1 is a single-stage liquid-fueled missile, with a range of up to 1,000 to 1,300 kilometers (810 miles), although longer ranges may be possible with a reduced warhead and maximum burn. There are also indications that there may be a No-Dong 2, using the same rocket motor, but with an improved fuel supply system that allows the fuel to burn for a longer period.
    - The missile is about 15.2 meters long -- four meters longer than the Scud B -- and 1.2 meters in diameter. The warhead is estimated to weigh 770 kilograms (1,200-1,750 pounds) and a warhead manufacturing facility exists near Pyongyang. The No-Dong has an estimated theoretical CEP of 700 meters at maximum range, versus 900 meters for the Scud B, although its practical accuracy could be as wide as 3,000-4,000 meters. It has an estimated terminal velocity of Mach 3.5, versus 2.5 for the Scud B, which presents added problems for tactical missile defense. The missile is be transportable on a modified copy of the MAZ-543P TEL that has been lengthened with a fifth axle and which is roughly 40 meters long. The added support stand for the vertical launch modes brings the overall length to 60 meters, and some experts questioned whether a unit this big is practical.
- Reports during the late 1980s and early 1990s indicated that Iran was also interested in two developmental North Korean IRBMs called the Tapeo Dong 1 and Tapeo Dong 2
    - The Tapeo Dong 1 missile has an estimated maximum range of 2,000 kilometers, and the Tapeo Dong 2 may have a range up to 3,500 kilometers.
    - Both Tapeo Dongs are liquid fueled missiles which seem to have two stages.
    - Unlike the No-Dong, the Tapeo Dongs must be carried to a site in stages and then assembled at a fixed site. The No-Dong transporter may be able to carry both stages of the Tapeo Dong 1, but some experts believe that a special transporter is needed for the first stage of the Tapeo Dong 1, and for both stages of the Tapeo Dong 2.
    - Since the early 1990s, however, the focus of reports on Iran's missile efforts have shifted, and it has since become clear that Iran is developing its own longer-range variants of the No Dong for indigenous production with substantial Russian and some Chinese aid:
    - As early as 1992, one such missile was reported to have a range of 800-930 miles and a 1,650 pound warhead. Reports differ sharply on its size. Jane's estimates a launch weight up to 16,000 kilograms, provided the system is derived from the No Dong. It could have a launch weight of 15,000 kilograms, a payload of 600 kilograms, and a range of 1,700-1,800 kilometers if it is based on a system similar to the Chinese CSS-5 (DF-21) and CSS-N3 ((JL-1). These systems entered service in 1983 and 1987.
    - A longer-range missile was said to have improved guidance components, a range of up to 1,240 miles and a warhead of up to 2,200 pounds.
    - IOC dates were then estimated to be 1999-2001.
- These developments may help explain the background to Iran's new Shahab system:

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- Some US experts believe that Iran tested booster engines in 1997 capable of driving a missile ranges of 1,500 kilometers. Virtually all US experts believe that Iran is rapidly approaching the point where it will be able to manufacture missiles with much longer ranges than the Scud B.
- Eitan Ben Eliyahu -- the commander of the Israeli Air Force -- reported on April 14, 1997 that Iran had tested a missile capable of reaching Israel. The background briefings to his statement implied that Russia was assisting Iran in developing two missiles -- with ranges of 620 and 780 miles Follow-on intelligence briefings that Israel provided in September, 1997, indicated that Russia was helping Iran develop four missiles. US intelligence reports indicate that China has also been helping Iran with some aspects of these missile efforts.
- These missiles included the Shahab ("meteor") missiles, with performance similar to those previously identified with Iranian missiles adapted from North Korean designs.
- The Israeli reports indicated that the Shahab 3 was a liquid-fueled missile with a range of 810 miles (1,200-1,500 kilometers) and a payload of 1550 pounds (700 kilometers).
- Israel claimed the Shahab might be ready for deployment as early as 1999**.**
    - Iran tested the Shahab 3 on July, 21 1998, claiming that it was a defensive action to deal with potential threats from Israel.
        - The missile flew for a distance of up to 620 miles, before it exploded about 100 seconds after launch. US intelligence sources could not confirm whether the explosion was deliberate, but indicated that the final system might have a range of 800-940 miles (a maximum of 1,240 kilometers), depending on its payload. The test confirmed the fact the missile was a liquid fueled system.
        - Gen. Mohammad Bagher Qalibaf, head of the Islamic Revolutionary Guards Corps' air wing publicly reported on August 2, 1998 that the Shahab-3 is 53-foot-long ballistic missile that can travel at 4,300 mph and carry a one-ton warhead at an altitude of nearly 82,000 feet. He claimed that the weapon was guided by an Iranian-made system that gives it great accuracy: "The final test of every weapon is in a real war situation but, given its warhead and size, the Shahab-3 is a very accurate weapon."
        - Other Iranian sources reported that the missile had a range of 800 miles. President Mohammad Khatami on August 1, 1998 stated that Iran was determined to continue to strengthen its armed forces, regardless of international concerns: "Iran will not seek permission from anyone for strengthening its defense capability."
        - Martin Indyck, the US Assistant Secretary for Near East Affairs testified on July 28, that the US estimated that the system needed further refinement but might be deployed in its initial operational form between September, 1998 and March, 1999.
        - Iran publicly displayed the Shahab 3 on its launcher during a parade on September 25, 1998. The missile carrier bore signs saying, "The US can do nothing" and "Israel would be wiped from the map."
        - There are some reports of a Shahab-3B missile with extended range and a larger booster.
        - The resulting system seems to be close to both the No-Dong and Pakistani Ghauri or Haff-5 missile, first tested in April 1998, raising questions about Iranian-North Korean-Pakistani cooperation.
        - North Korean parades exhibiting the Tapeo Dong in September 1999 exhibited a missile with rocket motor and nozzle characteristics similar to those of the Sahab 3.
        - The Shahab 3 was tested in a launch from a transporter-erector-launcher (TEL) from a new air base of the Islamic Revolutionary Guards at Mashad on February 20, 2000, and successfully demonstrated the integration of the engine and missile subsystems. It tested the system again in July 2000, with a nominal range of 810 miles.[465]
        - Iran tested a solid state missile it called the Shahab D on September 20, 2000. The Iranian Deputy Defense Minister, Vice admiral Ali Shamkani, claimed that it was part of a peaceful program for launching satellites. [466]
        - Iranian sources indicate that the missile has a inertial navigation system with a CEP of 3 kilometers, making it so inaccurate that it can only be lethal against area targets using a weapon of mass destruction.

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- Jane's Defense Weekly claimed on March 22, 2000 that US and Israeli intelligence officials felt the Shahab 3 was now ready for deployment.
- Iran announced on July 15, 2000 that it had successfully test-fired an upgraded version of its medium-range Shahab missile. An Iranian defence ministry source was quoted by state media as saying that the missile was test-fired to ensure it conforms to the latest technological standards. It was first tested in 1998. ``This missile is part of our program for the defence industry and it would in no way threaten other countries." Iran announced that the Shahab-3 is a ballistic missile, with a range of 800 miles, and could travel at a speed of 4,320 mph with a 1-ton warhead.
- Iran's Defence Minister Admiral Ali Shamkhani has said a larger missile, Shahab 4, was in production as a vehicle for launching satellites into space.[467]
- US experts indicated that they estimated the missile had a range of 1,300 km (800 miles), making it capable of hitting Israel, and that the Shahab-3 was modeled mainly on North Korea's Nodong-1, but has been improved with Russian technology. The the US intelligence community is divided whether Iran will sustain its current programs, and actually deploy a system capable of striking the US. US experts indicated that they estimated the missile had a range of 1,300 km (800 miles), making it capable of hitting Israel, and that the Shahab-3 was modeled mainly on North Korea's Nodong-1, but has been improved with Russian technology.[468]
- Secretary of Defense William Cohen stated that, [469] ``This does not come as a surprise…I have pointed to Iran and the testing of the Shahab-3 and what I assume will be the testing of the 4 in the future and beyond that, as one of the reasons why it is important for the United States to undertake to research, develop and potentially deploy an NMD (national missile defense) system that would provide protection against countries such as Iran posing a threat to the United States…This represents a continuation of their testing program, whether it was scheduled to coincide with the discussions in Washington is a matter only the Iranians can determine, we don't have any information pertaining to that.,. We accept it for what it is, we know that they will continue to test it, they will continue to develop a longer-range missile capability and that is one of the reasons why we believe it is important that the United States continue its research and testing and the development program for the NMD, precisely to deal with countries such as North Korea, Iran, Iraq and others. Anytime you have success in a particular missile system, that gives you confidence to move forward with more tests, with greater capability…So I think there is obviously a potential to accelerate development with each successful test…we have discussed this in the past, we believe that North Korea, Iran, potentially Iraq in the future and others will develop long-range missile capability. This is what we anticipate, this confirms our anticipation, and so this is a factor that will have to be taken into account in terms of what the time frame will be when Iran will have the capability of striking U.S. territory or that of European nations….Only the president can decide whether we should go forward at this point," Cohen said. ``But I think this is an issue that is not going to go away with the elections, and if there is any delay in the program, that another president will have to face it at some point because the threat will continue to expand. "
- Israeli expressed its own concerns. Amos Yaron, director-general of the Defence Ministry, told Israel Radio that, "We are looking at this matter for the moment with some concern because in any event they have the ability. We don't believe they have any intention whatsoever to attack the state of Israel for the moment… It must be remembered that Iran developed these capabilities as a result of the lessons they had from the wars of the past, which is to say from its big war against Iraq. Iran didn't develop this missile against the state of Israel…Now the Iranians have this ability. Between the ability and the intention, there is a great distance." A senior Israeli military source did predict, however, that by 2005, Iran would, with Russian help, achieve a military nuclear capability by 2005 with Russian help. Israel's army chief, Lieutenant-General Shaul Mofaz, told Israel Radio that the combined development of the missile and a non-conventional capacity posed a threat not only to Israel, but also to any country within range of the missile.[470]
- In spite of these developments, a number of US intelligence officials feel the NIC report was politicized by pressure from the policy level to support the NMD program, and to not disagree with the results of the Rumsfeld Commission,. They feel that Iran still faces problems in in its program to build the Shahab-3, which some feel is a missile with a range of only 780 miles. At least one official has been quoted on

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backround as stating that, “There is an Iranian threat to U.S. forces in the region, not to the continental United States.”

- US officials agree that Iran is considering developing a rocket that can put satellites in orbit, but note that that the development of such a booster would give Iran significantly enhanced capabilities to develop an intercontinental ballistic missile.[471] U.S. Defence Department spokesman Ken Bacon stated that,. “From everything we can tell, it was a successful firing. It is another sign they are determined to build longer-range weapons of mass destruction."[472]
- In short, it is impossible to dismiss the possibility that Iran might continue to develop nuclear weapons and long-range missiles in spite of its agreements not to do so. At the same time, there is no way to predict that Iran will definitely pose such a threat, or the size, timing, and effectiveness, of any forces it may deploy. The justification for an NMD system can be built around the *possibility* of an Iranian threat but – as is the case with North Korea – there is no way that the justification for an NMD system can be based on the *certainty* of an Iranian missile threat or that the US can now tailor the architecture of its NMD system to a clear concept of what that threat will be. There equally is no way that the need for an NMD system can be dismissed because of the lack of a valid potential threat.
- It is still unclear when Iran will be able to bring such programs to the final development stage, carry out a full range of suitable test firings, develop highly lethal warheads, and deploy actual units. Much may still depends on the level of foreign assistance.

- In September 1999, the Revolutionary Guard exhibited another missile called the Zelzal, which it stated was “now in mass production.” The missile was said to have taken four and one-half years to develop and to be derived from the Zelzal 2, which the IRGC had exhibited earlier. Some estimates indicate that it can carry a warhead of 500 kilograms for up to 900 kilometers. However, the missile exhibited in Tehran was a rocket on a truck-mounted launch rail that seemed more likely to have a range of 150-200 kilometers.
- Iranian Defense Minister Shamkhani has confirmed the development of a “more capable” missile called the Shahab 4. Although he later called it a space booster. He has also mentioned a Shahab 5.
  - Israeli and US intelligence sources have reported that that Iran is developing the Shahab 4, with a range of 2,000 kilometers (1,250 miles), a payload of around 2,000 pounds, and a CEP of around 2,400 meters. Some estimates indicate that this system could be operational in 2-5 years.
  - US Assistant Secretary for Near East Affairs testified on July 28, 1998, that the US estimated that the system still needed added foreign assistance to improve its motors and guidance system.
  - Some reports indicate that the Shahab 4 is based on the Soviet SS-4 missile. Others that there is a longer range Shahab 5, based on the SS-4 or Tapeo Dong missile. Reports saying the Shahab is based on the SS-4 say it has a range of up to 4,000 kilometers and a payload in excess of one ton.)
    - Iran may have two other missile programs include longer-range systems, variously reported as having maximum ranges of 3,650, 4,500-5,000, 6,250, or 10,000 kilometers.
    - There have been reports that Iran might be using Russian technology to develop long-range missiles with ranges from 2,000 to 6,250 kilometers.
    - It seems clear that Iran has obtained some of the technology and design details of the Russian SS-4. The SS-4 (also known as the R-12 or “Sandal”) is an aging Russian liquid fuel designed that first went into service in 1959, and which was supposedly destroyed as part of the IRBM Treaty. It is a very large missile, with technology dating back to the early 1950s, although it was evidently updated at least twice during the period between 1959 and 1980. It has a CEP of 2-4 kilometers and a maximum range 2,000 kilometers, which means it can only be lethal with a nuclear warhead or a biological weapon with near-nuclear lethality.
    - At the same time, the SS-4’s overall technology is relatively simple and it has a throwweight of nearly 1,400 kilograms (3,000 pounds). It is one of the few missile designs that a nation with a limited technology base could hope to manufacture or adapt, and its throwweight and range would allow Iran to use a relatively unsophisticated nuclear device or biological warhead. As a result, an updated version of the SS-4 might be a suitable design for a developing country.

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- Iran is reported to have carried out the test of a sea-launched ballistic missile in 1998.
- Russia has been a key supplier of missile technology.
    - Russia agreed in 1994 that it would adhere to the terms of the Missile Technology Control Regime and would place suitable limits on the sale or transfer of rocket engines and technology. Nevertheless, the CIA has identified Russia as a leading source of Iranian missile technology, and the State Department has indicated that President Clinton expressed US concerns over this cooperation to President Yeltsin. This transfer is one reason the President appointed former Ambassador Frank Wisner, and then Robert Galluci, as his special representatives to try to persuade Russia to put a firm halt to aid support of the Iran.
    - These programs are reported to have continuing support from North Korea, and from Russian and Chinese firms and technicians. One such Chinese firm is Great Wall Industries. The Russian firms include the Russian Central Aerohydrodynamic Institute, which has provided Iran's Shahid Hemmat Industrial Group (SHIG) with wind tunnels for missile design, equipment for manufacturing missile models, and the software for testing launch and reentry performance. They may also include Rosvoorouzhenie, a major Russian arms-export agency; NPO Trud, a rocket motor manufacturer; a leading research center called the Bauman Institute, and Polyus (Northstar), a major laser test and manufacturing equipment firm.
    - Some sources have indicated that Russian military industries have signed contracts with Iran to help produce liquid fueled missiles and provide specialized wind tunnels, manufacture model missiles, and develop specialized computer software. For example, these reports indicate that the Russian Central Aerohydrodynamic Institute is cooperating with Iran's Defense Industries Organization (DIO) and the DIO's Shahid Hemmat Industrial Group (SHIG). The Russian State Corporation for Export and Import or Armament and Military Equipment (Rosvoorouzhenie) and Infor are also reported to be involved in deals with the SHIG. These deals are also said to include specialized laser equipment, mirrors, tungsten-coast graphite material, and maraging steel for missile development and production. They could play a major role in help Iran develop long range versions of the Scud B and C, and more accurate variations of a missile similar to the No Dong.
    - The Israeli press reported in August, 1997 that Israeli had evidence that Iran was receiving Russian support. In September, 1997, Israel urged the US to step up its pressure on Iran, and leaked reported indicating that private and state-owned Russian firms had provided gyroscopes, electronic components, wind tunnels, guidance and propulsion systems, and the components needed to build such systems to Iran.
    - President Yeltsin and the Russian Foreign Ministry initially categorically denied that such charges were true. Following a meeting with Vice President Gore, President Yeltsin stated on September 26, 1997 that, "We are being accused of supplying Iran with nuclear or ballistic missile technologies. There is nothing further from the truth. I again and again categorically deny such rumors."
    - Russia agreed, however, that Ambassador Wisner and Yuri Koptyev, the head of the Russian space program, should jointly examine the US intelligence and draft a report on Russian transfers to Iran. This report reached a very different conclusion from President Yeltsin and concluded that Russia had provided such aid to Iran. Further, on October 1, 1997 -- roughly a week after Yeltsin issued his denial -- the Russian security service issued a statement that it had "thwarted" an Iranian attempt to have parts for liquid fuel rocket motors manufactured in Russia, disguised as gas compressors and pumps.
    - Russian firms said to be helping Iran included the Russian Central Aerohydrodynamic Institute which developed a special wind tunnel; Rosvoorouzhenie, a major Russian arms-export agency; Kutznetzov (formerly NPO Trud) a rocket motor manufacturer in Samara; a leading research center called the Bauman National Technical University in Moscow, involved in developing rocket propulsion systems; the Tsagi Research Institute for rocket propulsion development; and the Polyus (Northstar) Research Institute in Moscow, a major laser test and manufacturing equipment firm. Iranians were also found to be studying rocket engineering at the Baltic State University in St. Petersburg and the Bauman State University.
    - Russia was also found to have sold Iran high strength steel and special foil for its long-range missile program. The Russian Scientific and Production Center Inor concluded an agreement as late as September, 1997 to sell Iran a factory to produce four special metal alloys used in long-range missiles. Inor's director, L. P Chromova worked out a deal with A. Asgharzadeh, the director of an Iranian factory, to sell 620 kilograms of special alloy called 21HKMT, and provide Iran with the capability to thermally treat the alloy for missile bodies. Iran had previously bought 240

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kilograms of the alloy. Inor was also selling alloy foils called 49K2F, CUBE2, and 50N in sheets 0.2-0.4 millimeters thick for the outer body of missiles. The alloy 21HKMT was particularly interesting because North Korea also uses it in missile designs. Inor had previously brokered deals with the Shahid Hemat Industrial Group in Iran to supply maraging steel for missile cases, composite graphite-tungsten material, laser equipment, and special mirrors used in missile tests.

- The result was a new and often tense set of conversations between the US and Russia in January, 1998. The US again sent Ambassador Frank Wisner to Moscow, Vice President Gore called Prime Minster Viktor Chernomyrdin, and Secretary of State Madeline Albright made an indirect threat that the Congress might apply sanctions. Sergi Yastrzhembsky, a Kremlin spokesman, initially responded by denying that any transfer of technology had taken place.
- This Russian denial was too categorical to have much credibility. Russia had previously announced the arrest of an Iranian diplomat on November 14, 1997, that it caught attempting to buy missile technology. The Iranian was seeking to buy blueprints and recruit Russian scientists to go to Iran. Yuri Koptev, the head of the Russian Space Agency, explained this, however, by stating that that, "There have been several cases where some Russian organizations, desperately struggling to make ends meet and lacking responsibility, have embarked on some ambiguous projects...they were stopped long before they got to the point where any technology got out."
- The end result of these talks was an agreement by Gore and Chernomyrdin to strengthen controls over transfer technology, but it was scarcely clear that it put an end to the problem. As Koptev has said, "There have been several cases where some Russian organizations, desperately struggling to make ends meet and lacking responsibility, have embarked on some ambiguous projects." Conditions in Russia are getting worse, not better, and the desperation that drives sales has scarcely diminished.
- Prime Minister Chernomyrdin again promised to strengthen his efforts to restrict technology transfer to Iran in a meeting with Gore on March 12, 1998. The US informed Russia of 13 cases of possible Russian aid to Iran at the meeting and offered to increase the number of Russian commercial satellite launches it would license for US firms as an incentive.
- New arrests of smugglers took place on April 9, 1998. The smugglers had attempted to ship 22 tons of specialized steel to Iran via Azerbaijan, using several Russia shell corporations as a cover.
- On April 16, 1998, the State Department declared 20 Russian agencies and research facilities were ineligible to receive US aid because of their role in transferring missile technology to Iran.

- The CIA reported in June 1997 that Iran obtained major new transfers of new long-range missile technology from Russian and Chinese firms during 1996. Since that time, there have been many additional reports of technology transfer from Russia.
- The Rumsfeld Commission heard evidence that Iran had obtained engines or designs for the RD-214 rocket engine used in the SS-4 and SL-7 space launch vehicle.

- Reports on Chinese transfers of ballistic missile technology provide less detail:
  - There have been past reports that Iran placed orders for PRC-made M-9 (CSS-6/DF-15) missile (280-620 kilometers range, launch weight of 6,000 kilograms).
  - It is more likely, however, that PRC firms are giving assistance in developing indigenous missile R&D and production facilities for the production of an Iranian solid fueled missile.
  - The US offered to provide China with added missile technology if it would agree to fully implement an end of technology transfer to Iran and Pakistan during meetings in Beijing on March 25-26, 1998.
- Iran has, however, acquired much of the technology necessary build long-range cruise missile systems from China:
  - Such missiles would cost only 10% to 25% as much as ballistic missiles of similar range, and both the HY-2 Seersucker and CS-802 could be modified relatively quickly for land attacks against area targets.
  - Iran reported in December, 1995 that it had already fired a domestically built anti-ship missile called the Saeqe-4 (Thunderbolt) during exercises in the Strait of Hormuz and Gulf of Oman Other reports indicate that China is helping Iran build copies of the Chinese CS-801/CS-802 and the Chinese FL-2 or F-7 anti-ship cruise missiles. These missiles have relatively limited range. The range of the CS-801 is 8-40 kilometers, the range of the CS-802 is 15-120

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kilometers, the maximum range of the F-7 is 30 kilometers, and the maximum range of the FL-10 is 50 kilometers. Even a range of 120 kilometers would barely cover targets in the Southern Gulf from launch points on Iran's Gulf coast. These missiles also have relatively small high explosive warheads. As a result, Iran may well be seeking anti-ship capabilities, rather than platforms for delivering weapons of mass destruction.

- A platform like the CS-802 might, however, provide enough design data to develop a scaled-up, longer-range cruise missile for other purposes, and the Gulf is a relatively small area where most urban areas and critical facilities are near the coast. Aircraft or ships could launch cruise missiles with chemical or biological warheads from outside the normal defense perimeter of the Southern Gulf states, and it is at least possible that Iran might modify anti-ship missiles with chemical weapons to attack tankers -- ships which are too large for most regular anti-ship missiles to be highly lethal.

- Building an entire cruise missile would be more difficult. The technology for fusing CBW and cluster warheads would be within Iran's grasp. Navigation systems and jet engines, however, would still be a major potential problem. Current inertial navigation systems (INS) would introduce errors of at least several kilometers at ranges of 1,000 kilometers and would carry a severe risk of total guidance failure -- probably exceeding two-thirds of the missiles fired. A differential global positioning system (GPS) integrated with the inertial navigation system (INS) and a radar altimeter, however, might produce an accuracy of 15 meters. Some existing remotely piloted vehicles (RPVs), such as the South African Skua claim such performance. Commercial technology is becoming available for differential global positioning system (GPS) guidance with accuracies of 2 to 5 meters.

- There are commercially available reciprocating and gas turbine engines that Iran could adapt for use in a cruise missile, although finding a reliable and efficient turbofan engine for a specific design application might be difficult. An extremely efficient engine would have to be matched to a specific airframe. It is doubtful that Iran could design and build such an engine, but there are over 20 other countries with the necessary design and manufacturing skills.

- While airframe-engine-warhead integration and testing would present a challenge and might be beyond Iran's manufacturing skills, it is inherently easier to integrate and test a cruise missile than a long-range ballistic missile. Further, such developments would be far less detectable than developing a ballistic system if the program used coded or low altitude directional telemetry.

- Iran could bypass much of the problems inherent in developing its own cruise missile by modifying the HY-2 Seersucker for use as a land attack weapon and extending its range beyond 80 kilometers, or by modifying and improving the CS-801 (Ying Jai-1) anti-ship missile. There are reports that the Revolutionary Guards are working on such developments at a facility near Bandar Abbas.

- The CIA reported in January 1999 that entities in Russia and China continue to supply missile-related goods and technology to Iran. Tehran is using these goods and technologies to achieve its goal of becoming self-sufficient in the production of MRBMs. The July flight test of the Shahab-3 MRBM demonstrates the success Iran has achieved in realizing that goal. Iran already is producing Scud SRBMs with North Korean help and has begun production of the Shahab-3. In addition, Iran's Defense Minister has publicly acknowledged the development of the Shahab-4 ballistic missile, with a "longer range and heavier payload than the 1,300-km Shahab-3."

  - Iran's earlier success in gaining technology and materials from Russian companies accelerated Iranian development of the Shahab-3 MRBM, which was first flight tested in July 1998.

  - The CIA report on missile proliferation in September 1999 estimated that Iran is the next hostile country most capable of testing an ICBM capable of delivering a weapon to the United States during the next 15 years.

  - Iran *could test* an ICBM that could deliver a several-hundred kilogram payload to many parts of the United States in the latter half of the next decade, using Russian technology and assistance.

  - Iran *could pursue* a Taepo Dong-type ICBM. Most analysts believe it could test a three-stage ICBM patterned after the Taepo Dong-1 SLV or a three-stage Taepo Dong-2-type ICBM, possibly with North Korean assistance, in the next few years.

  - Iran is *likely to test* an SLV by 2010 that—once developed—could be converted into an ICBM capable of delivering a several-hundred kilogram payload to the United States.

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- Analysts differ on the likely timing of Iran's first flight test of an ICBM that could threaten the United States. Assessments include:
    - *likely* before 2010 and *very likely* before 2015 (noting that an SLV with ICBM capabilities will *probably be tested within the next few years)*;
    - no more than an *even chance* by 2010 and a *better than even chance* by 2015;
    - and less than an even chance by 2015.

- The DCI Nonproliferation Center (NPC) reported in February 2000 that entities in Russia and China continued to supply a considerable amount and a wide variety of ballistic missile-related goods and technology to Iran. Tehran is using these goods and technologies to support current production programs and to achieve its goal of becoming self-sufficient in the production of ballistic missiles. Iran already is producing Scud short-range ballistic missiles (SRBMs) and has built and publicly displayed prototypes for the Shahab-3 medium-range ballistic missile (MRBM), which had its initial flight test in July 1998 and probably has achieved "emergency operational capability"-i.e., Tehran could deploy a limited number of the Shahab-3 prototype missiles in an operational mode during a perceived crisis situation. In addition, Iran's Defense Minister last year publicly acknowledged the development of the Shahab-4, originally calling it a more capable ballistic missile than the Shahab-3, but later categorizing it as solely a space launch vehicle with no military applications. Iran's Defense Minister also has publicly mentioned plans for a "Shahab 5." It also stated that,

- Firms in China provided missile-related items, raw materials, and/or assistance to several countries of proliferation concern-such as Iran.

- Russian entities continued to supply a variety of ballistic missile-related goods and technical know-how to Iran and were expanding missile-related assistance to Syria and India. For example, Iran's earlier success in gaining technology and materials from Russian companies accelerated Iranian development of the Shahab-3 MRBM, which was first flight-tested in July 1998. Russian entities during the first six months of 1999 have provided substantial missile-related technology, training, and expertise to Iran that almost certainly will continue to accelerate Iranian efforts to build new indigenous ballistic missile systems… the government's commitment, willingness, and ability to curb proliferation-related transfers remain uncertain. Moreover, economic conditions in Russia continued to deteriorate, putting more pressure on Russian entities to circumvent export controls. Despite some examples of restraint, Russian businesses continue to be major suppliers of WMD equipment, materials, and technology to Iran. Monitoring Russian proliferation behavior, therefore, will remain a very high priority.

- Iranian Foreign Ministry spokesman Hamid Reza stated on Febvruary 3, 2000 that Iran had no intention of seeking missiles with the range to reach the US, and that the CIA was only making such charges to distract the world for Israel's nuclear weapons program.

- A CIA report in August 2000 summarized the state of missile proliferation in Iran as follows,[473]
- For the second half of 1999, entities in Russia, North Korea, and China continued to supply the largest amount of ballistic missile-related goods, technology, and expertise to Iran. Tehran is using this assistance to support current production programs and to achieve its goal of becoming self-sufficient in the production of ballistic missiles. Iran already is producing Scud short-range ballistic missiles (SRBMs) and has built and publicly displayed prototypes for the Shahab-3 medium-range ballistic missile (MRBM), which had its initial flight test in July 1998. In addition, Iran's Defense Minister last year publicly acknowledged the development of the Shahab-4, originally calling it a more capable ballistic missile than the Shahab-3, but later categorizing it as solely a space launch vehicle with no military applications. Iran's Defense Minister also has publicly mentioned plans for a "Shahab 5." Such statements, made against the backdrop of sustained cooperation with Russian, North Korean, and Chinese entities, strongly suggest that Tehran intends to develop a longer-range ballistic missile capability in the near future.
- Beginning in January 1998, the Russian Government took a number of steps to increase its oversight of entities involved in dealings with Iran and other states of proliferation concern. In 1999, it pushed a new export control law through the Duma. Russian firms, however, faced economic pressures to circumvent these controls and did so in some cases. The Russian Government, moreover, failed in some cases regarding Iran to enforce its export controls. Following repeated warnings, the US Government in January 1998 and January 1999 imposed administrative measures against Russian

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entities that had engaged in nuclear- and missile-related cooperation with Iran. The measures imposed on these and other Russian entities (which were penalized in 1998) remain in effect, although sanctions against two entities—Polyus and Inor—are being lifted.

- On the ACW side, Iran (which has acknowledged a need for Western military equipment and spare parts) continues to acquire Western equipment, such as attack helicopters, but also is developing indigenous production capabilities with assistance from countries such as Russia, China, and North Korea. Indigenous efforts involve such systems as tanks, TOW missiles, fighter aircraft, Chinese-designed SAMs and anti-ship missiles, and attack helicopters.
- …Russian entities (have) continued to supply a variety of ballistic missile-related goods and technical know-how to countries such as Iran, India, and Libya. Iran's earlier success in gaining technology and materials from Russian entities accelerated Iranian development of the Shahab-3 MRBM, which was first flight-tested in July 1998. Russian entities during the second six months of 1999 have provided substantial missile-related technology, training, and expertise to Iran that almost certainly will continue to accelerate Iranian efforts to develop new ballistic missile systems.
- Throughout the second half of 1999, North Korea continued to export significant ballistic missile-related equipment and missile components, materials, and technical expertise to countries in the Middle East, South Asia, and North Africa. P'yongyang attaches a high priority to the development and sale of ballistic missiles, equipment, and related technology. Exports of ballistic missiles and related technology are one of the North's major sources of hard currency, which fuel continued missile development and production.
- …Chinese missile-related technical assistance to Pakistan increased during this reporting period. In addition, firms in China provided missile-related items, raw materials, and/or assistance to several countries of proliferation concern—such as Iran, North Korea, and Libya.…China's 1997 pledge not to engage in any new nuclear cooperation with Iran has apparently held, but work associated with two remaining nuclear projects—a small research reactor and a zirconium production facility—continues. The Intelligence Community will continue to monitor carefully Chinese nuclear cooperation with Iran.

Chemical Weapons

- Iran purchased large amounts of chemical defense gear from the mid-1980s onwards. Iran also obtained stocks of non-lethal CS gas, although it quickly found such agents had very limited military impact since they could only be used effectively in closed areas or very small open areas.
- Acquiring poisonous chemical agents was more difficult. Iran did not have any internal capacity to manufacture poisonous chemical agents when Iraq first launched its attacks with such weapons. While Iran seems to have made limited use of chemical mortar and artillery rounds as early as 1985 -- and possibly as early as 1984 -- these rounds were almost certainly captured from Iraq.
- Iran had to covertly import the necessary equipment and supplies, and it took several years to get substantial amounts of production equipment, and the necessary feedstocks. Iran sought aid from European firms like Lurgi to produce large "pesticide" plants, and began to try to obtain the needed feedstock from a wide range of sources, relying heavily on its Embassy in Bonn to manage the necessary deals. While Lurgi did not provide the pesticide plant Iran sought, Iran did obtain substantial support from other European firms and feedstocks from many other Western sources.
- By 1986-1987, Iran developed the capability to produce enough lethal agents to load its own weapons. The Director of the CIA, and informed observers in the Gulf, made it clear that Iran could produce blood agents like hydrogen cyanide, phosgene gas, and/or chlorine gas. Iran was also able to weaponize limited quantities of blister (sulfur mustard) and blood (cyanide) agents beginning in 1987, and had some capability to weaponize phosgene gas, and/or chlorine gas. These chemical agents were produced in small batches, and evidently under laboratory scale conditions, which enabled Iran to load small numbers of weapons before any of its new major production plants went into full operation.
- These gas agents were loaded into bombs and artillery shells, and were used sporadically against Iraq in 1987 and 1988.
- Reports regarding Iran's production and research facilities are highly uncertain:
    - Iran seems to have completed completion of a major poison gas plant at Qazvin, about 150 kilometers west of Tehran. This plant is reported to have been completed between November, 1987 and January, 1988. While supposedly a pesticide plant, the facility's true purpose seems to have been poison gas production using organophosphorous compounds.

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  - It is impossible to trace all the sources of the major components and technology Iran used in its chemical weapons program during this period. Mujahideen sources claim Iran also set up a chemical bomb and warhead plant operated by the Zakaria Al-Razi chemical company near Mahshar in southern Iran, but it is unclear whether these reports are true.
  - Reports that Iran had chemical weapons plants at Damghan and Parchin that began operation as early as March, 1988, and may have begun to test fire Scuds with chemical warheads as early as 1988-1989, are equally uncertain.
  - Iran established at least one large research and development center under the control of the Engineering Research Centre of the Construction Crusade (Jahad e-Sazandegi), had established a significant chemical weapons production capability by mid-1989,
- Debates took place in the Iranian parliament or Majlis in late 1988 over the safety of Pasdaran gas plants located near Iranian towns, and that Rafsanjani described chemical weapons as follows: "Chemical and biological weapons are poor man's atomic bombs and can easily be produced. We should at least consider them for our defense. Although the use of such weapons is inhuman, the war taught us that international laws are only scraps of paper."
- Post Iran-Iraq War estimates of Iran chemical weapons production are extremely uncertain:
  - US experts believe Iran was beginning to produce significant mustard gas and nerve gas by the time of the August, 1988 cease-fire in the Iran-Iraq War, although its use of chemical weapons remained limited and had little impact on the fighting
  - Iran’s efforts to equip plants to produce V-agent nerve gases seem to have been delayed by US, British, and German efforts to limit technology transfers to Iran, but Iran may have acquired the capability to produce persistent nerve gas during the mid 1990s.
  - Production of nerve gas weapons started no later than 1994.
  - Began to stockpile of cyanide (cyanogen chloride), phosgene, and mustard gas weapons after 1985. Recent CIA testimony indicates that production capacity may approach 1,000 tons annually.
- Weapons include bombs and artillery. Shells include 155 mm artillery and mortar rounds. Iran also has chemical bombs and mines. It may have developmental chemical warheads for its Scuds, and may have a chemical package for its 22006 RPV (doubtful).
- There are reports that Iran has deployed chemical weapons on some of its ships.
- Iran has increased chemical defensive and offensive warfare training since 1993.
- Iran is seeking to buy more advanced chemical defense equipment, and has sought to buy specialized equipment on world market to develop indigenous capability to produce advanced feedstocks for nerve weapons.
  - CIA sources indicated in late 1996, that China might have supplied Iran with up to 400 tons of chemicals for the production of nerve gas.
  - One report indicated in 1996, that Iran obtained 400 metric tons of chemical for use in nerve gas weapons from China -- including carbon sulfide.
  - Another report indicated that China supplied Iran with roughly two tons of calcium-hypochlorate in 1996, and loaded another 40,000 barrels in January or February of 1997. Calcium-hypochlorate is used for decontamination in chemical warfare.
  - Iran placed several significant orders from China that were not delivered. Razak Industries in Tehran, and Chemical and Pharmaceutical Industries in Tabriz ordered 49 metric tons of alkyl dimethylamine, a chemical used in making detergents, and 17 tons of sodium sulfide, a chemical used in making mustard gas. The orders were never delivered, but they were brokered by Iran’s International Movalled Industries Corporation (Imaco) and China’s North Chemical Industries Co. (Nocinco). Both brokers have been linked to other transactions affecting Iran’s chemical weapons program since early 1995, and Nocinco has supplied Iran with several hundred tons of carbon disulfide, a chemical uses in nerve gas.

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- Another Chinese firm, only publicly identified as Q. Chen, seems to have supplied glass vessels for chemical weapons.
- The US imposed sanctions on seven Chinese firms in May, 1997, for selling precursors for nerve gas and equipment for making nerve gas -- although the US made it clear that it had, "no evidence that the Chinese government was involved." The Chinese firms were the Nanjing Chemical Industries Group and Jiangsu Yongli Chemical Engineering and Import/Export Corporation. Cheong Yee Ltd., a Hong Kong firm, was also involved. The precursors included tionyl chloride, dimethylamine, and ethylene chlorohydril. The equipment included special glass lined vessels, and Nanjing Chemical and Industrial Group completed construction of a production plant to manufacture such vessels in Iran in June, 1997.
- Iran sought to obtain impregnated Alumina, which is used to make phosphorous-oxychloride -- a major component of VX and GB -- from the US.
- It has obtained some equipment from Israelis. Nahum Manbar, an Israeli national living in France, was convicted in an Israeli court in May 1997 for providing Iran with $16 million worth of production equipment for mustard and nerve gas during the period from 1990 to 1995.
- CIA reported in June 1997 that Iran had obtained new chemical weapons equipment technology from China and India in 1996.
- India is assisting in the construction of a major new plant at Qazvim, near Tehran, to manufacture phosphorous pentasulfide, a major precursor for nerve gas. The plant is fronted by Meli Agrochemicals, and the program was negotiated by Dr. Mejid Tehrani Abbaspour, a chief security advisor to Rafsanjani.
- A recent report by German intelligence indicates that Iran has made major efforts to acquire the equipment necessary to produce Sarin and Tabun, using the same cover of purchasing equipment for pesticide plants that Iraq used for its Sa'ad 16 plant in the 1980s. German sources note that three Indian companies -- Tata Consulting Engineering, Transpek, and Rallis India -- have approached German pharmaceutical and engineering concerns for such equipment and technology under conditions where German intelligence was able to trace the end user to Iran

- Iran ratified the Chemical Weapons Convention in June 1997.
  - It submitted a statement in Farsi to the CWC secretariat in 1998, but this consisted only of questions in Farsi as to the nature of the required compliance.
  - It has not provided the CWC with any data on its chemical weapons program.
- The CIA estimated in January 1999 that Iran obtained material related to chemical warfare (CW) from various sources during the first half of 1998. It already has manufactured and stockpiled chemical weapons, including blister, blood, and choking agents and the bombs and artillery shells for delivering them. However, Tehran is seeking foreign equipment and expertise to create a more advanced and self-sufficient CW infrastructure.
- The CIA stated that Chinese entities sought to supply Iran with CW-related chemicals during 1997-1998 period. The US sanctions imposed in May 1997 on seven Chinese entities for knowingly and materially contributing to Iran's CW program remain in effect.
- The DCI Nonproliferation Center (NPC) reported in February 2000 that Iran, a Chemical Weapons Convention (CWC) party, already has manufactured and stockpiled chemical weapons, including blister, blood, and choking agents and the bombs and artillery shells for delivering them. During the first half of 1999, Tehran continued to seek production technology, expertise, and chemicals that could be used as precursor agents in its chemical warfare (CW) program from entities in Russia and China. It also acquired or attempted to acquire indirectly through intermediaries in other countries equipment and material that could be used to create a more advanced and self-sufficient CW infrastructure. It also stated that,
- Russian entities remain a significant source of biotechnology and chemicals for Iran. Russia's world-leading expertise in biological and chemical weapons would make it an attractive target for Iranians seeking technical information and training on BW and CW agent production processes.
- Chinese firms had supplied CW-related production equipment and technology to Iran. The US sanctions imposed in May 1997 on seven Chinese entities for knowingly and materially contributing to Iran's CW program remain in effect. In June

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1998, China announced that it had expanded its chemical export controls to include 10 of the 20 Australia Group chemicals not listed on the CWC schedules.

- A CIA report in August 2000 summarized the state of chemical weapons proliferation in Iran as follows,[474]
  - Iran remains one of the most active countries seeking to acquire WMD and ACW technology from abroad. In doing so, Tehran is attempting to develop an indigenous capability to produce various types of weapons—nuclear, chemical, and biological—and their delivery systems. During the reporting period, the evidence indicates increased reflections of Iranian efforts to acquire WMD- and ACW- related equipment, materials, and technology primarily on entities in Russia, China, North Korea and Western Europe.
  - Iran, a Chemical Weapons Convention (CWC) party, already has manufactured and stockpiled chemical weapons, including blister, blood, and choking agents and the bombs and artillery shells for delivering them. During the second half of 1999, Tehran continued to seek production technology, training, expertise, and chemicals that could be used as precursor agents in its chemical warfare (CW) program from entities in Russia and China. It also acquired or attempted to acquire indirectly through intermediaries in other countries equipment and material that could be used to create a more advanced and self-sufficient CW infrastructure.
  - Russian entities remain a significant source of biotechnology and chemicals for Iran. Russia's world-leading expertise in biological and chemical weapons would make it an attractive target for Iranians seeking technical information and training on BW and CW agent production processes. Russia (along with its sister republics in the FSU) also remains an important source of conventional weapons and spare parts for Iran, which is seeking to upgrade and replace its existing conventional weapons inventories.
  - Throughout the second half of 1999, North Korea continued to export significant ballistic missile-related equipment and missile components, materials, and technical expertise to countries in the Middle East, South Asia, and North Africa. P'yongyang attaches a high priority to the development and sale of ballistic missiles, equipment, and related technology. Exports of ballistic missiles and related technology are one of the North's major sources of hard currency, which fuel continued missile development and production.
  - Prior to the reporting period, Chinese firms had supplied CW-related production equipment and technology to Iran. The US sanctions imposed in May 1997 on seven Chinese entities for knowingly and materially contributing to Iran's CW program remain in effect. Evidence during the current reporting period suggests Iran continues to seek such assistance from Chinese entities, but it is unclear to what extent these efforts have succeeded. In June 1998, China announced that it had expanded its chemical export controls to include 10 of the 20 Australia Group chemicals not listed on the CWC schedules.

Biological Weapons

- Extensive laboratory and research capability.
- Weapons effort documented as early as 1982. Reports surfaced that Iran had imported suitable type cultures from Europe and was working on the production of Mycotoxins -- a relatively simple family of biological agents that require only limited laboratory facilities for small scale production.
- US intelligence sources reported in August, 1989, that Iran was trying to buy two new strains of fungus from Canada and the Netherlands that can be used to produce Mycotoxins. German sources indicated that Iran had successfully purchased such cultures several years earlier.
- The Imam Reza Medical Center at Mashhad Medical Sciences University and the Iranian Research Organization for Science and Technology were identified as the end users for this purchasing effort, but it is likely that the true end user was an Iranian government agency specializing in biological warfare.
- Many experts believe that the Iranian biological weapons effort was placed under the control of the Islamic Revolutionary Guards Corps, which is known to have tried to purchase suitable production equipment for such weapons.
- Since the Iran-Iraq War, Iran has conducted research on more lethal active agents like Anthrax, hoof and mouth disease, and biotoxins. In addition, Iranian groups have repeatedly approached various European firms for the equipment and technology necessary to work with these diseases and toxins.

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  - Unclassified sources of uncertain reliability have identified a facility at Damghan as working on both biological and chemical weapons research and production, and believe that Iran may be producing biological weapons at a pesticide facility near Tehran.
  - Some universities and research centers may be linked to biological weapons program.
  - Reports surfaced in the spring of 1993 that Iran had succeeded in obtaining advanced biological weapons technology in Switzerland and containment equipment and technology from Germany. According to these reports, this led to serious damage to computer facilities in a Swiss biological research facility by unidentified agents. Similar reports indicated that agents had destroyed German bio-containment equipment destined for Iran.
  - More credible reports by US experts indicate that Iran has begun to stockpile anthrax and Botulinum in a facility near Tabriz, can now mass manufacture such agents, and has them in an aerosol form. None of these reports, however, can be verified.
  - The CIA has reported that Iran has, "sought dual-use biotech equipment from Europe and Asia, ostensibly for civilian use." It also reported in 1996 that Iran might be ready to deploy biological weapons. Beyond this point, little unclassified information exists regarding the details of Iran's effort to "weaponize" and produce biological weapons.
- Iran may have the production technology to make dry storable and aerosol weapons. This would allow it to develop suitable missile warheads and bombs and covert devices.
- Iran may have begun active weapons production in 1996, but probably only at limited scale suitable for advanced testing and development.
- CIA testimony indicates that Iran is believed to have weaponized both live agents and toxins for artillery and bombs and may be pursuing biological warheads for its missiles. The CIA reported in 1996 that, "We believe that Iran holds some stocks of biological agents and weapons. Tehran probably has investigated both toxins and live organisms as biological warfare agents. Iran has the technical infrastructure to support a significant biological weapons program with little foreign assistance.
- CIA reported in June 1997 that Iran had obtained new dual use technology from China and India during 1996.
- Iran announced in June 1997 that it would not produce or employ chemical weapons including toxins.
- The CIA estimated in January 1999 that Iran continued to pursue purchasing dual-use biotechnical equipment from Russia and other countries, ostensibly for civilian uses. Its biological warfare (BW) program began during the Iran-Iraq war, and Iran may have some limited capability for BW deployment. Outside assistance is both important and difficult to prevent, given the dual-use nature of the materials and equipment being sought and the many legitimate end uses for these items.
- Russia remains a key source of biotechnology for Iran. Russia's world-leading expertise in biological weapons makes it an attractive target for Iranians seeking technical information and training on BW agent production processes.
- The DCI Nonproliferation Center (NPC) reported in February 2000 that Tehran continued to seek considerable dual-use biotechnical equipment from entities in Russia and Western Europe, ostensibly for civilian uses. Iran began a biological warfare (BW) program during the Iran-Iraq war, and it may have some limited capability for BW deployment. Outside assistance is both important and difficult to prevent, given the dual-use nature of the materials, the equipment being sought, and the many legitimate end uses for these items.
- A CIA report in August 2000 summarized the state of biological weapons proliferation in Iran as follows,[475]
  - For the reporting period, Tehran expanded its efforts to seek considerable dual-use biotechnical materials, equipment, and expertise from abroad—primarily from entities in Russia and Western Europe—ostensibly for civilian uses. Iran began a biological warfare (BW) program during the Iran-Iraq war, and it may have some limited capability for BW deployment. Outside assistance is both important and difficult to prevent, given the dual-use nature of the materials, the equipment being sought, and the many legitimate end uses for these items.
  - Russian entities remain a significant source of biotechnology and chemicals for Iran. Russia's world-leading expertise in biological and chemical weapons would make it an attractive target for Iranians seeking technical information and training on BW and CW agent production processes. Russia (along with its sister republics in the FSU) also remains an important source of conventional weapons and spare parts for Iran, which is seeking to upgrade and replace its existing conventional weapons inventories.

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Nuclear Weapons

- The Shah established the Atomic Energy Organization of Iran in 1974, and rapidly began to negotiate for nuclear power plants.
- He concluded an extendible ten year nuclear fuel contract with the US in 1974, with Germany in 1976, and France in 1977.
- In 1975, he purchased a 10% share in a Eurodif uranium enrichment plant being built at Tricastin in France that was part of a French, Belgian, Spanish, and Italian consortium. Under the agreement the Shah signed, Iran was to have full access to the enrichment technology Eurodif developed, and agreed to buy a quota of enriched uranium from the new plant.
- He created an ambitious plan calling for a network of 23 power reactors throughout Iran that was to be operating by the mid-1990s, and sought to buy nuclear power plants from Germany and France.
- By the time the Shah fell in January, 1979, he had six reactors under contract, and was attempting to purchase a total of 12 nuclear power plants from Germany, France, and the US. Two 1,300 megawatt German nuclear power plants at Bushehr were already 60% and 75% completed, and site preparation work had begun on the first of two 935 megawatt French plants at Darkhouin that were to be supplied by Framatome.
- The Shah also started a nuclear weapons program in the early to mid-1970s, building upon his major reactor projects, investment in URENCO, and smuggling of nuclear enrichment and weapons related technology from US and Europe.
- 5 megawatt light-water research reactor operating in Tehran.
- 27 kilowatt neutron-source reactor operating in Isfahan.
- Started two massive 1300 megawatt reactor complexes.
- The Shah attempted to covertly import controlled technology from the US/.
- US experts believe that Shah began a low-level nuclear weapons research program, centered at the Amirabad Nuclear Research Center. This research effort included studies of weapons designs and plutonium recovery from spent reactor fuel.
- It also involved a laser enrichment program which began in 1975, and led to a complex and highly illegal effort to obtain laser separation technology from the US. This latter effort, which does not seems to have had any success, continued from 1976 until the Shah's fall, and four lasers operating in the critical 16 micron band were shipped to Iran in October, 1978.
- At the same time, Iran worked on other ways to obtain plutonium, created a secret reprocessing research effort to use enriched uranium, and set up a small nuclear weapons design team.
- In 1976, Iran signed a secret contract to buy $700 million worth of yellow cake from South Africa, and appears to have reached an agreement to buy up to 1,000 metric tons a year. It is unclear how much of this ore South Africa shipped before it agreed to adopt IAEA export restrictions in 1984, and whether South Africa really honored such export restrictions. Some sources indicate that South Africa still made major deliveries as late as 1988-1989.
- Iran also tried to purchase 26.2 kilograms of highly enriched uranium; the application to the US for this purchase was pending when the Shah fell
- The Shah did eventually accept full IAEA safeguards but there value is uncertain .
- In 1984, Khomeini revived nuclear weapons program begun under Shah.
- Received significant West German and Argentine corporate support in some aspects of nuclear technology during the Iran-Iraq War.
- Limited transfers of centrifuge and other weapons related technology from PRC, possibly Pakistan.
- It has a Chinese-supplied heavy-water, zero-power research reactor at Isfahan Nuclear Research Center, and two-Chinese supplied sub-critical assemblies -- a light water and graphite design.

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- It has stockpiles of uranium and mines in Yazd area. It may have had a uranium-ore concentration facility at University of Tehran, but status unclear.
- Some experts feel that the IRGC moved experts and equipment from the Amirabad Nuclear Research Center to a new nuclear weapons research facility near Isfahan in the mid-1980s, and formed a new nuclear research center at the University of Isfahan in 1984 -- with French assistance. Unlike many Iranian facilities, the center at Isfahan was not declared to the IAEA until February 1992, when the IAEA was allowed to make a cursory inspection of six sites that various reports had claimed were the location of Iran's nuclear weapons efforts.
- (Bushehr I & II), on the Gulf Coast just southwest of Isfahan, were partially completed at the time of the Shah's fall. Iran attempted to revive the program and sought German and Argentine support, but the reactors were damaged by Iraqi air strikes in 1987 and 1988.
- Iran may also have opened a new uranium ore processing plant close to its Shagand uranium mine in March, 1990, and it seems to have extended its search for uranium ore into three additional areas. Iran may have also begun to exploit stocks of yellow cake that the Shah had obtained from South Africa in the late 1970s while obtaining uranium dioxide from Argentina by purchasing it through Algeria.
- Iran began to show a renewed interest in laser isotope separation (LIS) in the mid-1980s, and held a conference on LIS in September, 1987.
- Iran opened a new nuclear research center in Isfahan in 1984, located about four kilometers outside the city and between the villages of Shahrida and Fulashans. This facility was built at a scale far beyond the needs of peaceful research, and Iran sought French and Pakistani help for a new research reactor for this center.
- The Khomeini government may also have obtained several thousand pounds of uranium dioxide from Argentina by purchasing it through Algeria. Uranium dioxide is considerably more refined than yellow cake, and is easier to use in irradiating material in a reactor to produce plutonium.
- The status of Iran's nuclear program since the Iran-Iraq War is highly controversial, and Iran has denied the existence of such a program.
- On February 7, 1990, the speaker of the Majlis publicly toured the Atomic Energy Organization of Iran and opened the new Jabir Ibn al Hayyan laboratory to train Iranian nuclear technicians. Reports then surfaced that Iran had at least 200 scientists and a work force of about 2,000 devoted to nuclear research
- Iran's Deputy President Ayatollah Mohajerani stated in October, 1991, that Iran should work with other Islamic states to create an "Islamic bomb."
- The Iranian government has repeatedly made proposals to create a nuclear-free zone in the Middle East. For example, President Rafsanjani was asked if Iran had a nuclear weapons program in an interview in the CBS program *60 Minutes* in February 1997. He replied, "Definitely not. I hate this weapon."
- Other senior Iranian leaders, including President Khatami have made similar categorical denials. Iran's new Foreign Minister, Kamal Kharrazi, stated on October 5, 1997, that, "We are certainly not developing an atomic bomb, because we do not believe in nuclear weapons... We believe in and promote the idea of the Middle East as a region free of nuclear weapons and other weapons of mass destruction. But why are we interested to develop nuclear technology? We need to diversify our energy sources. In a matter of a few decades, our oil and gas reserves would be finished and therefore, we need access to other sources of energy...Furthermore, nuclear technology has many other utilities in medicine and agriculture. The case of the United States in terms of oil reserve is not different from Iran's The United States also has large oil resources, but at the same time they have nuclear power plants. So there is nothing wrong with having access to nuclear technology if it is for peaceful purposes..."
- The IAEA reports that Iran has fully complied with its present requirements, and that it has found no indications of nuclear weapons effort, but IAEA only inspects Iran's small research reactors.
- The IAEA visits to other Iranian sites are not inspections, and do not use instruments, cameras, seals, etc. The are informal walk-throughs.
- The IAEA visited five suspect Iranian facilities in 1992 and 1993 in this manner, but did not conduct full inspections.

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- Iran has not had any 93+2 inspections and its position on improved inspections is that it will not be either the first or the last to have them.
- Iranian officials have repeatedly complained that the West tolerated Iraqi use of chemical weapons and its nuclear and biological build-up during the Iran-Iraq War, and has a dual standard where it does not demand inspections of Israel or that Israel sign the NPT.
- These are reasons to assume that Iran still has a nuclear program:
- Iran attempted to buy highly enriched fissile material from Khazakstan. The US paid between $20 million and $30 million to buy 1,300 pounds of highly enriched uranium from the Ust-Kamenogorsk facility in Khazakstan that Iran may have sought to acquire in 1992. A total of 120 pounds of the material -- enough for two bombs -- cannot be fully accounted for.
- Iran has imported maraging steel, sometimes used for centrifuges, by smuggling it in through dummy fronts. Britain intercepted 110 pound (50 kilo) shipment in August, 1996. Seems to have centrifuge research program at Sharif University of Technology in Tehran. IAEA “visit” did not confirm.
- Those aspects of Iran's program that are visible indicate that Iran has had only uncertain success. Argentina agreed to train Iranian technicians at its Jose Balaseiro Nuclear Institute, and sold Iran $5.5 million worth of uranium for its small Amirabad Nuclear Research Center reactor in May 1987. A CENA team visited Iran in late 1987 and early 1988, and seems to have discussed selling sell Iran the technology necessary to operate its reactor with 20% enriched uranium as a substitute for the highly enriched core provided by the US, and possibly uranium enrichment and plutonium reprocessing technology as well. Changes in Argentina's government, however, made it much less willing to support proliferation. The Argentine government announced in February, 1992, that it was canceling an $18 million nuclear technology sale to Iran because it had not signed a nuclear safeguards arrangement. Argentine press sources suggested, however, that Argentina was reacting to US pressure.
- In February, 1990 a Spanish paper reported that Associated Enterprises of Spain was negotiating the completion of the two nuclear power plants at Bushehr. Another Spanish firm called ENUSA (National Uranium Enterprises) was to provide the fuel, and Kraftwerke Union (KWU) would be involved. Later reports indicated that a 10 man delegation from Iran's Ministry of Industry was in Madrid negotiating with the Director of Associated Enterprises, Adolofo Garcia Rodriguez.
- Iran negotiated with Kraftwerke Union and CENA of Germany in the late 1980s and early 1990s. Iran attempted to import reactor parts from Siemens in Germany and Skoda in Czechoslovakia. None of these efforts solved Iran’s problems in rebuilding its reactor program, but all demonstrate the depth of its interest.
- Iran took other measures to strengthen its nuclear program during the early 1990s. It installed a cyclotron from Ion Beam Applications in Belgium at a facility in Karzaj in 1991.
- Iran conducted experiments in uranium enrichment and centrifuge technology at its Sharif University of Technology in Tehran. Sharif University was also linked to efforts to import cylinders of fluorine suitable for processing enriched material, and attempts to import specialized magnets that can be used for centrifuges, from Thyssen in Germany in 1991.
- In 1992, Iran attempted to buy beryllium from a storage site in Kazakhstan that also was storing 600 kilograms of highly enriched uranium. These contacts then seem to have expanded to an attempt to try the material, In 1994, they helped lead the US to buy the enriched material and fly it out of the country.
- It is clear from Iran’s imports that it has sought centrifuge technology ever since. Although many of Iran’s efforts have never been made public, British customs officials seized 110 pounds of maraging steel being shipped to Iran in July 1996.
- Iran seems to have conducted research into plutonium separation and Iranians published research on uses of tritium that had applications to nuclear weapons boosting. Iran also obtained a wide range of US and other nuclear literature with applications for weapons designs. Italian inspectors seized eight steam condensers bound for Iran that could be used in a covert reactor program in 1993, and high technology ultrasound equipment suitable for reactor testing at the port of Bari in January, 1994.

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- Other aspects of Iran's nuclear research effort had potential weapons applications. Iran continued to operate an Argentine-fueled five megawatt light water highly enriched uranium reactor at the University of Tehran. It is operated by a Chinese-supplied neutron source research reactor, and subcritical assemblies with 900 grams of highly enriched uranium, at its Isfahan Nuclear Research Center. This Center has experimented with a heavy water zero-power reactor, a light water sub-critical reactor, and a graphite sub-critical reactor. In addition, it may have experimented with some aspects of nuclear weapons design.
- The German Ministry of Economics has circulated a wide list of such Iranian fronts which are known to have imported or attempted to import controlled items. These fronts include the:
  - Bonyad e-Mostazafan;
  - Defense Industries Organization (Sazemane Sanaye Defa);
  - Pars Garma Company, the Sadadja Industrial Group (Sadadja Sanaye Daryaee);
  - Iran Telecommunications Industry (Sanaye Mokhaberet Iran);
  - Shahid Hemat Industrial Group, the State Purchasing Organization, Education Research Institute (ERI);
  - Iran Aircraft Manufacturing Industries (IAI);
  - Iran Fair Deal Company, Iran Group of Surveyors;
  - Iran Helicopter Support and Renewal Industries (IHI);
  - Iran Navy Technical Supply Center;
  - Iran Tehran Kohakd Daftar Nezarat, Industrial Development Group;
  - Ministry of Defense (Vezerate Defa).

- Iran claims it eventually needs to build enough nuclear reactors to provide 20% of its electric power. This Iranian nuclear power program presents serious problems in terms of proliferation. Although the reactors are scarcely ideal for irradiating material to produce Plutonium or cannibalizing the core, they do provide Iran with the technology base to make its own reactors, have involved other technology transfer helpful to Iran in proliferating and can be used to produce weapons if Iran rejects IAEA safeguards.
  - Russian has agreed to build up to four reactors, beginning with a complex at Bushehr -- with two 1,000-1,200 megawatt reactors and two 465 megawatt reactors, and provide significant nuclear technology.
  - Russia has consistently claimed the light water reactor designs for Bushehr cannot be used to produce weapons grade Plutonium and are similar to the reactors the US is providing to North Korea.
  - The US has claimed, however, that Victor Mikhaliov, the head of Russia's Atomic Energy Ministry, proposed the sale of a centrifuge plant in April, 1995. The US also indicated that it had persuaded Russia not to sell Iran centrifuge technology as part of the reactor deal during the summit meeting between President's Clinton and Yeltsin in May, 1995.
  - It was only after US pressure that Russia publicly stated that it never planned to sell centrifuge and advanced enrichment technology to Iran, and Iran denied that it had ever been interested in such technology. For example, the statement of Mohammed Sadegh Ayatollahi, Iran's representative to the IAEA, stated that, "We've had contracts before for the Bushehr plant in which we agreed that the spent fuel would go back to the supplier. For our contract with the Russians and Chinese, it is the same." According to some reports, Russia was to reprocess the fuel at its Mayak plant near Chelyabinsk in the Urals, and could store it at an existing facility, at Krasnoyarsk-26 in southern Siberia.
  - The CIA reported in June 1997 that Iran had obtained new nuclear technology from Russia during 1996.
  - A nuclear accident at plant at Rasht, six miles north of Gilan, exposed about 50 people to radiation in July, 1996.
  - Russian Nuclear Energy Minister Yevgeny Adamov and Russian Deputy Prime Minister Vladimir Bulgak visited in March, 1998. and Iran and dismissed US complaints about the risk the reactors would be used to proliferate.

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  - Russia indicated that it would go ahead with selling two more reactors for construction at Bushehr within the next five years.
- The first 1,000 megawatt reactor at Bushehr has experienced serious construction delays. In March, 1998, Russia and Iran agreed to turn the construction project into a turn key plant because the Iranian firms working on infrastructure had fallen well behind schedule. In February, Iran had agreed to fund improved safety systems. The reactor is reported to be on a 30- month completion cycle.
- The US persuaded the Ukraine not to sell Iran $45 million worth of turbines for its nuclear plant in early March, 1998, and to strengthen its controls on Ukrainian missile technology under the MTCR.

- The CIA reported in January 1999 that Russia remained a key supplier for civilian nuclear programs in Iran and, to a lesser extent, India. With respect to Iran's nuclear infrastructure, Russian assistance would enhance Iran's ability to support a nuclear weapons development effort. Such assistance is less likely to significantly advance India's effort, given that India's nuclear weapons program is more mature. By its very nature, even the transfer of civilian technology may be of use in the nuclear weapons programs of these countries.
- Following intense and continuing engagement with the United States, Russian officials have taken some positive steps. Russia has committed to observe certain limits on its nuclear cooperation with Iran, such as not providing militarily useful nuclear technology.
- In January 1998, the Russian Government issued a broad decree prohibiting Russian companies from exporting items known or believed to be used for developing WMD or related delivery systems, whether or not these items are on Russia's export control list. In May 1998, Russia announced a decree intended to strengthen compliance of Russian businesses with existing export controls on proliferation-related items. These actions, if enforced, could help to counter the proliferation of WMD and their delivery systems.
- However, there are signs that Russian entities have continued to engage in behavior inconsistent with these steps. Monitoring Russian proliferation behavior, therefore, will have to remain a very high priority for some time to come.
- On January 14, 2000, Russia's Minister of Defense Igor Ivanavov met with Hassan Rowhani, the secretary of Iran's Supreme National Security Council, and promised that Russia would maintain defense cooperation, and that Russia, "intends to fulfill its obligations under the agrements made in 1989-1990."
- The same day, Vice Minister Ilya Klebanov met with Hassan Rowhani, and announced that Iran might order three additional Russian reactors.
- The CIA warned in January 2000 that Russia might have sold Iran heavy water and graphite technology.
  - China is reported to have agreed to provide significant nuclear technology transfer and possible sale of two 300 megawatt pressurized water reactors in the early 1990s, but then to have agreed to halt nuclear assistance to Iran after pressure from the US.
  - Iran signed an agreement with China's Commission on Science, Technology, and Industry for National Defense on January 21, 1991, to build a small 27-kilowatt research reactor at Iran's nuclear weapons research facility at Isfahan. On November 4, 1991, China stated that it had signed commercial cooperation agreements with Iran in 1989 and 1991, and that it would transfer an electromagnetic isotope separator (Calutron) and a smaller nuclear reactor, for "peaceful and commercial" purposes.
  - The Chinese reactor and Calutron were small research-scale systems and had no direct value in producing fissile material. They did, however, give Iran more knowledge of reactor and enrichment technology, and US experts believe that China provided Iran with additional data on chemical separation, other enrichment technology, the design for facilities to convert uranium to uranium hexaflouride to make reactor fuel, and help in processing yellowcake.
  - The US put intense pressure on China to halt such transfers. President Clinton and Chinese President Jiang Zemin reached an agreement at an October, 1997 summit. China strengthened this pledge in negations with the US in February, 1998.
  - In March, 1998, the US found that the China Nuclear Energy Corporation was negotiating to sell Iran several hundred tons of anhydrous hydrogen fluoride (AHF) to Isfahan Nuclear Research Corporation in central Iran, a site where

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some experts believe Iran is working on the development of nuclear weapons. AHF can be used to separate plutonium, help refine yellow cake into uranium hexaflouride to produce U-235, and as a feedstock for Sarin. It is on two nuclear control lists. China agreed to halt the sale.

- Iran denied that China had halted nuclear cooperation on March 15, 1998.
- Even so, the US acting Under Secretary of State for Arms Control and International Security Affairs stated that China was keeping its pledge not to aid Iran on March 26, 1998.

- The CIA reported in January 1999 that China continued to take steps to strengthen its control over nuclear exports. China promulgated new export control regulations in June 1998 that cover the sale of dual-use nuclear equipment. This follows on the heels of the September 1997 promulgation of controls covering the export of equipment and materials associated exclusively with nuclear applications. These export controls should give the Chinese Government greater accounting and control of the transfer of equipment, materials, and technology to nuclear programs in countries of concern.
- China pledged in late 1997 not to engage in any new nuclear cooperation with Iran and to complete work on two remaining nuclear projects—a small research reactor and a zirconium production facility—in a relatively short period of time. During the first half of 1998, Beijing appears to have implemented this pledge. The Intelligence Community will continue to monitor carefully Chinese nuclear cooperation with Iran.
- During the reporting period, Chinese entities provided a variety of missile-related items and assistance to several countries of proliferation concern. China also was an important supplier of ACW to Iran through the first half of 1998.
- The control of fissile material in the FSU remains a major problem:
  - US estimates indicate the FSU left a legacy of some 1,485 tons of nuclear material. This include 770 tons in some 27,000 weapons, including 816 strategic bombs, 5,434 missile warheads, and about 20,000 theater and tactical weapons. In addition, there were 715 tons of fissile or near-fissile material in eight countries of the FSU in over 50 sites: enough to make 35,000-40,000 bombs.
  - There are large numbers of experienced FSU technicians, including those at the Russian weapons design center at Arzamas, and at nuclear production complexes at Chelyabinsk, Krasnoyarsk, and Tomsk.
  - These factors led the US to conduct Operation Sapphire in 1994, where the US removed 600 kilograms of highly enriched uranium from the Ulba Metallurgy Plant in Kazakhstan at a time Iran was negotiating for the material.
  - They also led to Britain and the US cooperating in Auburn Endeavor, and airlifting fissile material out of a nuclear research facility in Tiblisi, Georgia. There were 10 pounds of material at the institute, and 8.8 pounds were HEU. (It takes about 35 pounds to make a bomb.) This operation was reported in the New York Times on April 21, 1998. The British government confirmed it took place, but would not give the date.
  - The Jerusalem Post reported on April 9, 1998 that Iran had purchased four tactical nuclear weapons from Russian smugglers for $25 million in the early 1990s, that the weapons had been obtained from Kazakhstan in 1991, and that Argentine technicians were helping to activate the weapon.
  - It quoted what it claimed was an Iranian report, dated December 26, 1991, of a meeting between Brigadier General Rahim Safavi, the Deputy Commander of the Revolutionary Guards and Reza Amrohalli, then head of the Iranian atomic energy organization.
  - It also quoted a second document -- dated January 2, 1992 --- saying the Iranians were awaiting the arrival of Russian technicians to show them how to disarm the protection systems that would otherwise inactivate the weapons if anyone attempted to use them.
  - The documents implied the weapons were flawed by did not indicate whether Iran had succeeded in activating them.
  - The US intelligence community denied any evidence that such a transfer had taken place.
  - The most detailed reports of Iran’s nuclear weapons program are the least reliable, and come from the People's Mujahideen, a violent, anti-regime, terrorist group. Such claims are very doubtful, but the People’s Mujahideen has reported that:
  - Iran’s facilities include a weapons site called Ma'allem Kelayah, near Qazvin on the Caspian. This is said to be an IRGC-run facility established in 1987, which has involved an Iranian investment of $300 million. Supposedly, the site

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was to house the 10 megawatt reactor Iran tried to buy from India.

- Two Soviet reactors were to be installed at a large site at Gorgan on the Caspian, under the direction of Russian physicists.
- The People's Republic of China provided uranium enrichment equipment and technicians for the site at Darkhouin, where Iran once planned to build a French reactor.
- A nuclear reactor was being constructed at Karaj; and that another nuclear weapons facility exists in the south central part of Iran, near the Iraqi border.
- The ammonia and urea plant that the British firm M. W. Kellog was building at Borujerd in Khorassan province, near the border with Turkestan, might be adapted to produce heavy water.
- The Amir Kabar Technical University, the Atomic Energy Organization of Iran (AEOI) (also known as the Organization for Atomic Energy of Iran or AEOI), Dor Argham Ltd., the Education and Research Institute, GAM Iranian Communications, Ghoods Research Center, Iran Argham Co., Iran Electronic Industries, Iranian Research Organization, Ministry of Sepah, Research and Development Group, Sezemane Sanaye Defa, the Sharif University of Technology, Taradis Iran Computer Company, and Zakaria Al-Razi Chemical Company are all participants in the Iranian nuclear weapons effort.
- Other sources based on opposition data have listed the Atomic Energy Organization of Iran, the Laser Research Center and Ibn-e Heysam Research and Laboratory Complex, the Bonab Atomic Energy Research Center (East Azerbaijan), the Imam Hussein University of the Revolutionary Guards, the Jabit bin al-Hayyan Laboratory, the Khoshomi uranium mine (Yazd), a possible site at Moallem Kalayeh, the Nuclear Research Center at Tehran University, the Nuclear Research Center for Agriculture and Medicine (Karaj), the Nuclear Research Center of Technology (Isfahan), the Saghand Uranium mine (Yazd), the Sharif University (Tehran) and its Physics Research Center.
- The CIA estimated in January 1999 that Iran remains one of the most active countries seeking to acquire WMD technology and ACW. During the reporting period, Iran focused its efforts to acquire WMD-related equipment, materials, and technology primarily on two countries: Russia and China. Iran is seeking to develop an indigenous capability to produce various types of nuclear, chemical, and biological weapons and their delivery systems. It also stated that,

- Russian entities continued to market and support a variety of nuclear-related projects in Iran during the first half of 1998, ranging from the sale of laboratory equipment for nuclear research institutes to the construction of a 1,000-megawatt nuclear power reactor in Bushehr, Iran, that will be subject to International Atomic Energy Agency (IAEA) safeguards. These projects, along with other nuclear-related purchases, will help Iran augment its nuclear technology infrastructure, which in turn would be useful in supporting nuclear weapons research and development.
- Russia has committed to observe certain limits on its nuclear cooperation with Iran. For example, President Yel'tsin has stated publicly that Russia will not provide militarily useful nuclear technology to Iran. Beginning in January this year, the Russian Government has taken a number of steps. For example, in May 1998, Russia announced a decree intended to strengthen compliance of Russian businesses with existing export controls on proliferation-related items.
- China continued to work on one of its two remaining projects—to supply Iran's civil nuclear program with a zirconium production facility. This facility will be used by Iran to produce cladding for reactor fuel. As a party to the Nuclear Nonproliferation Treaty, Iran is required to apply IAEA safeguards to nuclear fuel, but safeguards are not required for the zirconium plant or its products. During the US-China October 1997 Summit, China pledged not to engage in any new nuclear cooperation with Iran and to complete cooperation on two ongoing nuclear projects in a relatively short time. This pledge appears to be holding. In addition, China promulgated new export regulations in June 1998 that cover the sale of dual-use nuclear equipment. The regulations took effect immediately and were intended to strengthen control over equipment and material that would contribute to proliferation. Promulgation of these regulations fulfills Jiang Zemin's commitment to the United States last fall to implement such controls by the middle of 1998.
- Iran claims to desire the establishment of a complete nuclear fuel cycle for its civilian energy program. In that guise, it seeks to obtain whole facilities, such as a uranium conversion facility, that, in fact, could be used in any number of ways in support of efforts to produce fissile material needed for a nuclear weapon. Despite outside efforts to curtail the flow of

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critical technologies and equipment, Tehran continues to seek fissile material and technology for weapons development and has set up an elaborate system of military and civilian organizations to support its effort.

- The DCI Nonproliferation Center (NPC) reported in February 2000 that Iran sought nuclear-related equipment, material, and technical expertise from a variety of sources, especially in Russia, during the first half of 1999. Work continues on the construction of a 1,000-megawatt nuclear power reactor in Bushehr, Iran, that will be subject to International Atomic Energy Agency (IAEA) safeguards. In addition, Russian entities continued to interact with Iranian research centers on various activities. These projects will help Iran augment its nuclear technology infrastructure, which in turn would be useful in supporting nuclear weapons research and development. The expertise and technology gained, along with the commercial channels and contacts established-even from cooperation that appears strictly civilian in nature-could be used to advance Iran's nuclear weapons research and developmental program. It also reported that:

- Russia has committed to observe certain limits on its nuclear cooperation with Iran. For example, President Yel'tsin has stated publicly that Russia will not provide militarily useful nuclear technology to Iran. Beginning in January 1998, the Russian Government took a number of steps to increase its oversight of entities involved in dealings with Iran and other states of proliferation concern. In 1999, it pushed a new export control law through the Duma. Russian firms, however, faced economic pressures to circumvent these controls and did so in some cases. The Russian Government, moreover, failed in some cases regarding Iran to enforce its export controls. Following repeated warnings, the US Government in January 1999 imposed administrative measures against Russian entities that had engaged in nuclear- and missile-related cooperation with Iran. The measures imposed on these and other Russian entities (which were identified in 1998) remain in effect.

- Following intense and continuing engagement with the US, Russian officials took some positive steps to enhance oversight of Russian entities and their interaction with countries of concern. Russia has reiterated previous commitments to observe certain limits on its nuclear cooperation with Iran, such as not providing militarily useful nuclear technology, although-as indicated above-Russia continues to provide Iran with nuclear technology that could be applied to Iran's weapons program. President Yel'tsin in July 1999 signed a federal export control law, which formally makes WMD-related transfers a violation of law and codifies several existing decrees-including catch-all controls-yet may lessen punishment for violators.

- China pledged in October 1997 not to engage in any new nuclear cooperation with Iran but said it would complete cooperation on two ongoing nuclear projects, a small research reactor and a zirconium production facility at Esfahan that Iran will use to produce cladding for reactor fuel. The pledge appears to be holding. As a party to the Nuclear Nonproliferation Treaty (NPT), Iran is required to apply IAEA safeguards to nuclear fuel, but safeguards are not required for the zirconium plant or its products.

- Iran is attempting to establish a complete nuclear fuel cycle for its civilian energy program. In that guise, it seeks to obtain whole facilities, such as a uranium conversion facility, that, in fact, could be used in any number of ways in support of efforts to produce fissile material needed for a nuclear weapon. Despite international efforts to curtail the flow of critical technologies and equipment, Tehran continues to seek fissile material and technology for weapons development and has set up an elaborate system of military and civilian organizations to support its effort.

- The Washington Times reported on June 30, 2000, that a June 8th U.S. intelligence report by the National Security Agency, had stated that stated that Russia is sending tritium gas to a nuclear weapons research center in Tehran.

- The Iranian Ministry of Defense stated on January 18, 2000 that, "The Islamic Republic of Iran, which has taken the initiative to launch a dialogue of civilizations does not need to resort to nuclear weapons…or violence."

- On May 17, 2000, Gholamreza Aghazadeh, the head of Iran's Atomic Energy Organization told the visting Director General of the IAEA, Mohammed Elbaradei, that Iran was seeking IAEA help in running a nuclear research center west of Teheran studying nuclear applications in medicine and agriculture. He again stated that Iran opposed the use of nuclear technology in weapons, and claimed that Iran's nuclear power program had suffered because of US efforts to block technology transfer.

- A CIA report in August 2000 summarized the state of nuclear weapons proliferation in Iran as follows,[476]

  - Iran remains one of the most active countries seeking to acquire WMD and ACW technology from abroad. In doing so, Tehran is attempting to develop an indigenous capability to produce various types of weapons—nuclear, chemical, and biological—and their delivery systems. During the reporting period, the evidence indicates increased reflections

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of Iranian efforts to acquire WMD- and ACW- related equipment, materials, and technology primarily on entities in Russia, China, North Korea and Western Europe.

- Iran sought nuclear-related equipment, material, and technical expertise from a variety of sources, especially in Russia, during the second half of 1999. Work continues on the construction of a 1,000-megawatt nuclear power reactor in Bushehr, Iran, that will be subject to International Atomic Energy Agency (IAEA) safeguards. In addition, Russian entities continued to interact with Iranian research centers on various activities. These projects will help Iran augment its nuclear technology infrastructure, which in turn would be useful in supporting nuclear weapons research and development. The expertise and technology gained, along with the commercial channels and contacts established—even from cooperation that appears strictly civilian in nature—could be used to advance Iran's nuclear weapons research and developmental program.

- Beginning in January 1998, the Russian Government took a number of steps to increase its oversight of entities involved in dealings with Iran and other states of proliferation concern. In 1999, it pushed a new export control law through the Duma. Russian firms, however, faced economic pressures to circumvent these controls and did so in some cases. The Russian Government, moreover, failed in some cases regarding Iran to enforce its export controls. Following repeated warnings, the US Government in January 1998 and January 1999 imposed administrative measures against Russian entities that had engaged in nuclear- and missile-related cooperation with Iran. The measures imposed on these and other Russian entities (which were penalized in 1998) remain in effect, although sanctions against two entities—Polyus and Inor—are being lifted.

- China pledged in October 1997 not to engage in any new nuclear cooperation with Iran but said it would complete cooperation on two ongoing nuclear projects, a small research reactor and a zirconium production facility at Esfahan that Iran will use to produce cladding for reactor fuel. The pledge appears to be holding. As a party to the Nuclear Nonproliferation Treaty (NPT), Iran is required to apply IAEA safeguards to nuclear fuel, but safeguards are not required for the zirconium plant or its products.

- Iran claims that it is attempting to establish a complete nuclear fuel cycle for its civilian energy program. In that guise, it seeks to obtain whole facilities, such as a uranium conversion facility, that, in fact, could be used in any number of ways in support of efforts to produce fissile material needed for a nuclear weapon. Despite international efforts to curtail the flow of critical technologies and equipment, Tehran continues to seek fissile material and technology for weapons development and has set up an elaborate system of military and civilian organizations to support its effort.

- During the second half of 1999, Russia also remained a key supplier for civilian nuclear programs in Iran, primarily focused on the Bushehr Nuclear Power Plant project. With respect to Iran's nuclear infrastructure, Russian assistance enhances Iran's ability to support a nuclear weapons development effort. By its very nature, even the transfer of civilian technology may be of use in Iran's nuclear weapons program. We remain concerned that Tehran is seeking more than a buildup of its civilian infratructure, and the IC will be closely monitoring the relationship with Moscow for any direct assistance in support of a military program. In addition, Russia supplied India with material for its civilian nuclear program during this reporting period.

- Following intense and continuing engagement with the US, Russian officials took some positive steps to strengthen the legal basis of export controls. President Yel'tsin in July 1999 signed a federal export control law, which formally makes WMD-related transfers a violation of law and codifies several existing decrees—including catch-all controls—yet may lessen punishment for violators. Russian export enforcement and prosecution still remains weak, however. The export law is still awaiting completion of implementing decrees and its legal status is unclear. Public comments by the head of Russia's security council indicate that Russia obtained only three convictions for export control violations involving WMD and missile technology during 1998-99.

- Nonetheless, the Russian government's commitment, willingness, and ability to curb proliferation-related transfers remain uncertain. Moreover, economic conditions in Russia continued to deteriorate, putting more pressure on Russian entities to circumvent export controls. Despite some examples of restraint, Russian businesses continue to be major suppliers of WMD equipment, materials, and technology to Iran. Specifically, Russia continues to provide Iran with nuclear technology that could be applied to Iran's weapons program. Monitoring Russian proliferation behavior, therefore, will remain a very high priority.

- …Chinese missile-related technical assistance to Pakistan increased during this reporting period. In addition, firms in China provided missile-related items, raw materials, and/or assistance to several countries of proliferation concern—

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such as Iran, North Korea, and Libya.…China's 1997 pledge not to engage in any new nuclear cooperation with Iran has apparently held, but work associated with two remaining nuclear projects—a small research reactor and a zirconium production facility—continues. The Intelligence Community will continue to monitor carefully Chinese nuclear cooperation with Iran.

- US estimates of Iran's progress in acquiring nuclear weapons have changed over time.
  - In 1992, the CIA estimated that Iran would have the bomb by the year 2000. In 1995, John Holum testified that Iran could have the bomb by 2003.
  - In 1997, after two years in which Iran might have made progress, he testified that Iran could have the bomb by 2005-2007.
  - In 1999, the NIE on proliferation estimated that Iran could test a missile that could reach the US by 2010, but did not change the 1997 estimate or when Iran might acquire a bomb.
  - In early 2000, the New York Time reported that the CIA had warned that Iran might now be able to maker a nuclear weapon. The assessment stated that the CIA could not monitor Iran closely enough to be certain whether Iran had acquired fissile material from an outside source.
  - US experts increasingly refer to Iran's efforts as "creeping proliferation" and there is no way to tell when or if Iranian current efforts will produce a weapon, and unclassified lists of potential facilities have little credibility..
  - Timing of weapons acquisition depends heavily on whether Iran can buy fissile material -- if so it has the design capability and can produce weapons in 1-2 years -- or must develop the capability to process Plutonium or enrich Uranium -- in which case, it is likely to be 5-10 years.

Missile Defenses

- Seeking Russian S-300 or S-400 surface-to-air missile system with limited anti tactical ballistic missile capability.

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Iraqi Force Developments

Iraq is currently under UN sanctions that include controls on its imports and how it uses its oil revenues, and which prohibit the sale or transfer of long-range missiles, weapons of mass destruction, and dual-use technology to Iraq. The Gulf War destroyed some of its capability and UNSCOM dismantled much of its missile holdings and production capabilities between 1991 and 1998, as well as many of its stocks and capabilities to produce weapons of mass destruction. The US and Britain struck hard at Iraq's remaining missile production capabilities in Operation Desert Fox in December 1998.

Nevertheless, Table IX-2 shows that Iraq retains significant capabilities to design and build long-range missiles, and chemical, biological and nuclear weapons. Although UNSCOM and the IAEA succeeded in destroying much of its capabilities, and virtually all of its fissile material production facilities, Iraq has managed to retain the capability to build missiles with ranges of 150 kilometers or less, and has exploited this situation to develop facilities which can rapidly be converted to the production of longer-range missiles. UNSCOM also ceased to carry out effective inspections in late 1998, and its replacement – UNMOVIC – shows little sign of ever accomplishing its goals, Iraq is now free to resume a large-scale covert program.

US Assessments of Iraqi Capabilities

The sheer complexity and persistence of the Iraqi effort described in Table IX-2 is a warning of what the current regime in Iraq may do if it can ever fully free itself of UN sanctions. It shows that Iraq continues to try to import dual-use components that can be used in the production of nuclear weapons, and much of its biological weapons equipment has never been found. It is also important to note that Iraq has persisted in such efforts at the cost of nearly a decade of sanctions, massive economic sacrifices, and the inability to import conventional arms. Table IX-2 is also a history of immense costs and immense sacrifices involving a full spectrum of massive programs – facts that are generally ignored by those who focus on the human costs of sanctions while ignoring the potential cost of not maintaining them.

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A CIA report in August 2000 summarized the overall state of proliferation in Iraq as follows,[477]

> Since Operation Desert Fox in December 1998, Baghdad has refused to allow United Nations inspectors into Iraq as required by Security Council Resolution 687. Although UN Security Council Resolution (UNSCR) 1284, adopted in December 1999, established a follow-on inspection regime to the United Nations Special Commission on Iraq (UNSCOM) in the form of the United Nations Monitoring, Verification, and Inspection Committee (UNMOVIC), there have been no UN inspections during this reporting period. Moreover, the automated video monitoring system installed by the UN at known and suspect WMD facilities in Iraq has been dismantled by the Iraqis. Having lost this on-the-ground access, it is difficult for the UN or the US to accurately assess the current state of Iraq's WMD programs.
>
> Since the Gulf war, Iraq has rebuilt key portions of its chemical production infrastructure for industrial and commercial use, as well as its missile production facilities. It has attempted to purchase numerous dual-use items for, or under the guise of, legitimate civilian use. This equipment—in principle subject to UN scrutiny—also could be diverted for WMD purposes. Since the suspension of UN inspections in December 1998, the risk of diversion has increased.
>
> Following Desert Fox, Baghdad again instituted a reconstruction effort on those facilities destroyed by the US bombing, to include several critical missile production complexes and former dual-use CW production facilities. In addition, it appears to be installing or repairing dual-use equipment at CW-related facilities. Some of these facilities could be converted fairly quickly for production of CW agents.
>
> UNSCOM reported to the Security Council in December 1998 that Iraq continued to withhold information related to its CW and BW programs. For example, Baghdad seized from UNSCOM inspectors an Air Force document discovered by UNSCOM that indicated that Iraq had not consumed as many CW munitions during the Iran-Iraq War in the 1980s as had been declared by Baghdad. This discrepancy indicates that Iraq may have an additional 6,000 CW munitions hidden.
>
> We do not have any direct evidence that Iraq has used the period since Desert Fox to reconstitute its WMD programs, although given its past behavior, this type of activity must be regarded as likely. We assess that since the suspension of UN inspections in December of 1998, Baghdad has had the capability to reinitiate both its CW and BW programs within a few weeks to months, but without an inspection monitoring program, it is difficult to determine if Iraq has done so. We know, however, that Iraq has continued to work on its unmanned aerial vehicle (UAV) program, which involves converting L-29 jet trainer aircraft originally acquired from Eastern Europe. These modified and refurbished L-29s are believed to be intended for delivery of chemical or biological agents.
>
> Iraq continues to pursue development of two SRBM systems which are not prohibited by the United Nations: the liquid-propellant Al-Samoud, and the solid-propellant Ababil-100. The Al-Samoud is essentially a scaled-down Scud, and the program allows Baghdad to develop technological improvements that could be applied to a longer range missile program. We believe that the Al-Samoud missile, as designed, is capable of exceeding the UN-permitted 150-km-range restriction with a potential operational range of about 180 kilometers. Personnel previously involved with the Condor II/Badr-2000 missile—which was largely destroyed during the Gulf war and eliminated by UNSCOM—are working on the Ababil-100 program. If economic sanctions against Iraq were lifted, Baghdad probably would attempt to convert these efforts into longer range missile systems, regardless of continuing UN monitoring and continuing restrictions on WMD and long-range missile programs.

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The National Intelligence Council has provided an additional summary of a possible future the Iraqi ballistic missile threat to the US:[478]

> "Although the Gulf war and subsequent United Nations activities destroyed much of Iraq's missile infrastructure, Iraq could test an ICBM capable of reaching the United States during the next 15 years.
>
> - After observing North Korean activities, Iraq most likely would pursue a three-stage Taepo Dong-2 approach to an ICBM (or SLV), which could deliver a several-hundred kilogram payload to parts of the United States. If Iraq could buy a Taepo Dong-2 from North Korea, it could have a launch capability within months of the purchase; if it bought Taepo Dong engines, it could test an ICBM by the middle of the next decade. Iraq probably would take until the end of the next decade to develop the system domestically.
>
> - Although much less likely, most analysts believe that if Iraq were to begin development today, it could test a much less capable ICBM in a few years using Scud components and based on its prior SLV experience or on the Taepo Dong-1.
>
> - If it could acquire No Dongs from North Korea, Iraq could test a more capable ICBM along the same lines within a few years of the No Dong acquisition.
>
> - Analysts differ on the likely timing of Iraq's first flight test of an ICBM that could threaten the United States. Assessments include unlikely before 2015; and likely before 2015, possibly before 2010—foreign assistance would affect the capability and timing."

Iraqi Post-Sanctions Capabilities and Iraqi Intentions

Once again, there is no way to determine what capabilities Iraq will actually create or how far it will go in developing warfighting options. It does seems likely, however, that if Saddam Hussein or his immediate coterie remain in power that Iraqi will be an aggressive and revanchist state. This could take the form of an effort to create a missile threat to the Gulf, the region, Europe, and the US. *Any* Iraqi leadership with ambitions to seize the territory of another power in the region might conclude that Iraq would need a credible deterrent capability to strike the US in order to prevent the US from using its forces to halt Iraqi military action.

The sheer nature of the past Iraqi actions shown in Table IX-2 is also a warning that Iraq is perfectly capable of using missiles and weapons of mass destruction. At the same time, it is far from clear that Iraq will act recklessly. Even a relatively hostile leadership might conclude that using weapons of mass destruction and long-range missiles would simply catalyze ever more

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serious action against Iran. It must also be aware that the US might preempt – as it did in striking Iraqi missile production facilities in December 1999 during operation Desert Fox.

At the same time, even a now and more moderate regime might continue to proliferate. Such a regime might conclude that creating a regional capability to strike with missiles and weapons of mass destruction would hold the allies, power projection forces, and bases of the US as hostages without triggering the kind of reaction the US might make to a direct threat to its Homeland. Given the other major proliferators in the region -- which include India, Iran, Israel, Pakistan, and Syria – even a regime that is not actively hostile to the US might continue to develop nuclear weapons and long-range missiles in spite of its agreements not to do so.

The US, the Southern Gulf states, and Europe must not abandon efforts to "roll back" both Iraqi and Iranian proliferation. However, a steadily creeping process of proliferation now seems likely, and may well go on in spite of changes in regime. Deterrence, defense, and retaliation will be most important tools to deal with the problem. The genie probably cannot be forced back into the bottle. The most that can be done is to force it to hide in the cave.

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Table IX-2

Iraqi Missile Threats and Proliferation

Delivery Systems

- Prior to the Gulf War Iraq had extensive delivery systems incorporating long-range strike aircraft with refueling capabilities and several hundred regular and improved, longer-range Scud missiles, some with chemical warheads. These systems included:
    - Tu-16 and Tu-22 bombers.
    - MiG-29 fighters.
    - Mirage F-1, MiG-23BM, and Su-22 fighter attack aircraft.
    - A Scud force with a minimum of 819 missiles.
    - Extended range Al Husayn Scud variants (600 kilometer range) extensively deployed throughout Iraq, and at three fixed sites in northern, western, and southern Iraq.
    - Developing Al-Abbas missiles (900 kilometer range), which could reach targets in Iran, the Persian Gulf, Israel, Turkey, and Cyprus.
    - Long-range super guns with ranges of up to 600 kilometers.
- Iraq also engaged in efforts aimed at developing the Tamuz liquid fueled missile with a range of over 2,000 kilometers, and a solid fueled missile with a similar range. Clear evidence indicates that at least one design was to have a nuclear warhead.
- Iraq attempted to conceal a plant making missile engines from the UN inspectors. It only admitted this plant existed in 1995, raising new questions about how many of its missiles have been destroyed.
- Iraq had design work underway for a nuclear warhead for its long-range missiles.
- The Gulf War deprived Iraq of some of its MiG-29s, Mirage F-1s, MiG-23BMs, and Su-22s.
- Since the end of the war, the UN inspection regime has also destroyed many of Iraq's long-range missiles:
    - UNSCOM has directly supervised the destruction of 48 Scud-type missiles.
    - It has verified the Iraqi unilateral destruction of 83 more missiles and 9 mobile launchers.
- A State Department summary issued on November 16, 1998, indicates that UNSCOM has supervised the destruction of::
- 48 operational missiles;
- 14 conventional missile warheads;
- six operational mobile launchers; 28 operational fixed launch pads;
- 32 fixed launch pads;
- 30 missile chemical warheads;
- other missile support equipment and materials, and a variety of assembled and non-assembled supergun components.
- 38,537 filled and empty chemical munitions;
- 90 metric tons of chemical weapons agent;
- more than 3,000 metric tons of precursor chemicals;
- 426 pieces of chemical weapons production equipment; and,

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- 91 pieces of related analytical instruments.
- The entire al-Hakam biological weapons production facility and a variety of production equipment and materials.
- The UN estimates that it is able to account for 817 of the 819 long-range missiles that Iraq imported in the period ending in 1988:
    - Pre-1980 expenditures, such as training 8
    - Expenditures during the Iran-Iraq War (1980-1981), including the war
    - of the cities in February-April 1988 516
    - Testing activities for the development of Iraq's modifications of
    - imported missiles and other experimental activities (1985-1990) 69
    - Expenditures during the Gulf War (January-March 191) 93
    - Destruction under the supervision of UNSCOM 48
    - Unilateral destruction by Iraq (mid-July and October 1991 83
    - UNSCOM's analysis has shown that Iraq had destroyed 83 of the 85 missiles it had claimed were destroyed. at the same time, it stated that Iraq had not given an adequate account of its proscribed missile assets, including launchers, warheads, and propellants.
    - UNSCOM also reports that it supervised the destruction of 10 mobile launchers, 30 chemical warheads, and 18 conventional warheads.
- Iraq maintains a significant delivery capability consisting of:
    - HY-2, SS-N-2, and C-601 cruise missiles, which are unaffected by UN cease-fire terms.
    - FROG-7 rockets with 70 kilometer ranges, also allowed under UN resolutions.
    - Multiple rocket launchers and tube artillery.
    - Experimental conversions such as the SA-2.
- Iraq claims to have manufactured only 80 missile assemblies, 53 of which were unusable. UNSCOM claims that 10 are unaccounted for.
    - US experts believe Iraq may still have components for several dozen extended-range Scud missiles.
- In addition, Iraq has admitted to:
    - Hiding its capability to manufacture its own Scuds.
    - Developing an extended range variant of the FROG-7 called the Laith. The UN claims to have tagged all existing FROG-7s to prevent any extension of their range beyond the UN imposed limit of 150 kilometers for Iraqi missiles.
    - Experimenting with cruise missile technology and ballistic missile designs with ranges up to 3,000 kilometers.
    - Flight testing Al Husayn missiles with chemical warheads in April 1990.
    - Developing biological warheads for the Al Husayn missile as part of Project 144 at Taji.
    - Initiating a research and development program for a nuclear warhead missile delivery system.
    - Successfully developing and testing a warhead separation system.
    - Indigenously developing, testing, and manufacturing advanced rocket engines to include liquid-propellant designs.
    - Conducting research into the development of Remotely Piloted Vehicles (RPVs) for the dissemination of biological agents.

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  - Attempting to expand its Ababil-100 program designed to build surface-to-surface missiles with ranges beyond the permitted 100-150 kilometers.
  - Importing parts from Britain, Switzerland, and other countries for a 350 mm "super gun," as well as starting an indigenous 600 mm supergun design effort.
- Iraq initially claimed that it had 45 missile warheads filled with chemical weapons in 1992. It then stated that it had 20 chemical and 25 biological warheads in 1995. UNSCOM established that it had a minimum of 75 operational warheads and 5 used for trials. It has evidence of the existence of additional warheads. It can only verify that 16 warheads were filled with Sarin, and 34 with chemical warfare binary components, and that 30 were destroyed under its supervision -- 16 with Sarin and 14 with binary components.
- US and UN officials conclude further that:
  - Iraq is trying to rebuild its ballistic missile program using a clandestine network of front companies to obtain the necessary materials and technology from European and Russian firms.
  - This equipment is then concealed and stockpiled for assembly concomitant with the end of the UN inspection regime.
  - The equipment clandestinely sought by Iraq includes advanced missile guidance components, such as accelerometers and gyroscopes, specialty metals, special machine tools, and a high-tech, French-made, million-dollar furnace designed to fabricate engine parts for missiles.
- Recent major violations and smuggling efforts:
  - In November, 1995, Iraq was found to have concealed an SS-21 missile it had smuggled in from Yemen.
  - Jordan found that Iraq was smuggling missile components through Jordan in early December, 1995. These included 115 gyroscopes in 10 crates, and material for making chemical weapons. The shipment was worth an estimated $25 million. Iraq claimed the gyroscopes were for oil exploration but they are similar to those used in the Soviet SS-N-18 SLBM. UNSCOM also found some gyroscopes dumped in the Tigris.
- Iraq retains the technology it acquired before the war and evidence clearly indicates an ongoing research and development effort, in spite of the UN sanctions regime.
- The fact the agreement allows Iraq to continue producing and testing short-range missiles (less than 150 kilometers range) means it can retain significant missile development effort.
  - The SA-2 is a possible test bed, but UNSCOM has tagged all missiles and monitors all high apogee tests.
  - Iraq's Al-Samoud and Ababil-100 programs are similar test beds. The Al-Samoud is a scaled-down Scud which Iraq seems to have tested.
  - Iraq continues to expand its missile production facility at Ibn Al Haytham, which has two new buildings large enough to make much longer-range missiles.
  - US satellite photographs reveal that Iraq has rebuilt its Al-Kindi missile research facility.
- Ekeus reported on December 18, 1996 that Iraq retained missiles, rocket launchers, fuel, and command system to "make a missile force of significance". UNSCOM reporting as of October, 1997 is more optimistic, but notes that Iraq, "continued to conceal documents describing its missile propellants, and the material evidence relating to its claims to have destroyed its indigenous missile production capabilities indicated in might has destroyed less than a tenth of what it claimed"
- The CIA reported in January 1999 that Iraq is developing two ballistic missiles that fall within the UN-allowed 150-km range restriction. The Al Samoud liquid-propellant missile—described as a scaled-down Scud—began flight-testing in 1997.
- Technicians for Iraq's pre-war Scud missiles are working on the Al Samoud program and, although under UNSCOM supervision, are developing technological improvements that could be applied to future longer-range missile programs. The Ababil-100 solid-propellant missile is also under development, although progress on this system lags the Al Samoud. After economic sanctions are lifted and UN inspections cease, Iraq could utilize expertise from these programs in the development of longer-range missile systems.

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- A State Department report in September 1999 noted that:
  - Iraq has refused to credibly account for 500 tons of SCUD propellant, over 40 SCUD biological and conventional warheads, 7 Iraqi-produced Scuds, and truckloads of SCUD components.
  - Iraq refuses to allow inspection of thousands of Ministry of Defense and Military Industries Commission documents relating to biological and chemical weapons and long-range missiles.
- The CIA estimated in September 1999 that although the Gulf war and subsequent United Nations activities destroyed much of Iraq's missile infrastructure, Iraq could test an ICBM capable of reaching the United States during the next 15 years.
  - After observing North Korean activities, Iraq *most likely would pursue* a three-stage Taepo Dong-2 approach to an ICBM (or SLV), which could deliver a several-hundred kilogram payload to parts of the United States. If Iraq could buy a Taepo Dong-2 from North Korea, it *could have a launch capability* within months of the purchase; if it bought Taepo Dong engines, it *could test* an ICBM by the middle of the next decade. Iraq probably would take until the end of the next decade to develop the system domestically.
  - Although much less likely, most analysts believe that if Iraq were to begin development today, it *could test* a much less capable ICBM in a few years using Scud components and based on its prior SLV experience or on the Taepo Dong-1.
  - If it could acquire No Dongs from North Korea, Iraq *could test* a more capable ICBM along the same lines within a few years of the No Dong acquisition.
  - Analysts differ on the likely timing of Iraq's first flight test of an ICBM that could threaten the United States. Assessments include *unlikely* before 2015; and *likely* before 2015, possibly before 2010—foreign assistance would affect the capability and timing.
- The DCI Nonproliferation Center (NPC) reported in February 2000 that Iraq has continued to work on the two SRBM systems authorized by the United Nations: the liquid-propellant Al-Samoud, and the solid-propellant Ababil-100. The Al-Samoud is essentially a scaled-down Scud, and the program allows Baghdad to develop technological improvements that could be applied to a longer range missile program. We believe that the Al-Samoud missile, as designed, is capable of exceeding the UN-permitted 150-km-range restriction with a potential operational range of about 180 kilometers. Personnel previously involved with the Condor II/Badr-2000 missile-which was largely destroyed during the Gulf war and eliminated by UNSCOM-are working on the Ababil-100 program. Once economic sanctions against Iraq are lifted, Baghdad probably will begin converting these efforts into longer range missile systems, unless restricted by future UN monitoring.
- Defense interlligence experts say on background that Iraq has rebuilt many of the facilities the US struck in Desert Fox, including 12 factories and sites associated with missile construction and the production of weapons of mass destruction. These are said to include the missile facilities at Al Taji.479
- US intelligence reports in June 2000 indicated that Iraq has resumed testing of missiles under 150 kilometers in range, possibly the system modified from the SA-2. They say that the system is not ready for deployment, and that there are problems with the rocket motor, guidance system, and there is no evidence Iraq is ready to start production.
- A CIA report in August 2000 summarized the state of missile development in Iraq as follows,480
- Since the Gulf war, Iraq has rebuilt key portions of its chemical production infrastructure for industrial and commercial use, as well as its missile production facilities. It has attempted to purchase numerous dual-use items for, or under the guise of, legitimate civilian use. This equipment—in principle subject to UN scrutiny—also could be diverted for WMD purposes. Since the suspension of UN inspections in December 1998, the risk of diversion has increased.
- Following Desert Fox, Baghdad again instituted a reconstruction effort on those facilities destroyed by the US bombing, to include several critical missile production complexes and former dual-use CW production facilities. In addition, it appears to be installing or repairing dual-use equipment at CW-related facilities. Some of these facilities could be converted fairly quickly for production of CW agents.
- Iraq continues to pursue development of two SRBM systems which are not prohibited by the United Nations: the liquid-propellant Al-Samoud, and the solid-propellant Ababil-100. The Al-Samoud is essentially a scaled-down Scud, and the

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Chemical Weapons

- Iraq is the only major recent user of weapons of mass destruction. US intelligence sources report the following Iraqi uses of chemical weapons:

Date	Area	Type of Gas	Approximate Casualties	Target
August 1983	Haij Umran	Mustard	Less than 100	Iranians/Kurds
October-November 1983	Panjwin	Mustard	3,0000	Iranians/Kurds
February-March 1984	Majnoon Island	Mustard	2,500	Iranians
March 1984	Al Basrah	Tabun	50- 100	Iranians
March 1985	Hawizah Marsh	Mustard/Tabun	3,000	Iranians
February 1996	Al Faw	Mustard/Tabun	8,000-10,000	Iranians
December 1986	Umm ar Rasas	Mustard	1,000s	Iranians
April 1987	Al Basrah	Mustard/Tabun	5,000	Iranians
October 1987	Sumar/Mehran	Mustard/Nerve Agents	3,000	Iranians
March 1988	Halabjah	Mustard/Nerve Agents	Hundreds	Iranians/Kurds

Note: Iranians also used poison gas at Halabjah and may have caused some of the casualties.

- In revelations to the UN, Iraq admitted that, prior to the Gulf War, it:
    - Procured more than 1,000 key pieces of specialized production and support equipment for its chemical warfare program.
    - Maintained large stockpiles of mustard gas, and the nerve agents Sarin and Tabun.
    - Produced binary Sarin filled artillery shells, 122 mm rockets, and aerial bombs.
    - Manufactured enough precursors to produce 70 tons (70,000 kilograms) of the nerve agent VX. These precursors included 65 tons of choline and 200 tons of phosphorous pentasulfide and di-isopropylamine
    - Tested Ricin, a deadly nerve agent, for use in artillery shells.
    - Had three flight tests of long-range Scuds with chemical warheads.
    - Had a large VX production effort underway at the time of the Gulf War. The destruction of the related weapons and feedstocks has been claimed by Iraq, but not verified by UNSCOM. Iraq seems to have had at least 3,800 kilograms of V-agents by time the of the Gulf War, and 12-16 missile warheads.
- The majority of Iraq's chemical agents were manufactured at a supposed pesticide plant located at Muthanna. Various other production facilities were also used, including those at Salman Pak, Samara, and Habbiniyah. Though severely damaged during the war, the physical plant for many of these facilities has been rebuilt.
- Iraq possessed the technology to produce a variety of other persistent and non-persistent agents.
- The Gulf War and the subsequent UN inspection regime may have largely eliminated some of stockpiles and reduced production capability.

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- During 191-1994, UNSCOM supervised the destruction of:
    - 38,537 filled and unfilled chemical munitions.
    - 690 tons of chemical warfare agents.
    - More than 3,000 tons of precursor chemicals.
    - Over 100 pieces of remaining production equipment at the Muthan State Establishment, Iraq's primary CW research, production, filling and storage site.
- Since that time, UNSCOM has forced new disclosures from Iraq that have led to:
    - The destruction of 325 newly identified production equipment, 120 of which were only disclosed in August, 1997.
    - The destruction of 275 tons of additional precursors.
    - The destruction of 125 analytic instruments.
    - The return of 91 analytic pieces of equipment to Kuwait.
- As of February, 1998, UNSCOM had supervised the destruction of a total of:
    - 40,000 munitions, 28,000 filled and 12,000 empty.
    - 480,000 liters of chemical munitions
    - 1,800,000 liters of chemical precursors.
    - eight types of delivery systems including missile warheads.
- US and UN experts believe Iraq has concealed significant stocks of precursors. Iraq also appears to retain significant amounts of production equipment dispersed before, or during, Desert Storm and not recovered by the UN.
- UNSCOM reports that Iraq has failed to account for
    - Special missile warheads intended for filling with chemical or biological warfare agent.
    - The material balance of some 550 155 mm mustard gas shells, the extent of VX programs, and the rationale for the acquisition of various types of chemical weapons
    - 130 tons of chemical warfare agents.
    - Some 4,000 tons of declared precursors for chemical weapons,
    - The production of several hundred tons of additional chemical warfare agents, the consumption of chemical precursors,
    - 107,500 empty casings for chemical weapons,
    - Whether several thousand additional chemical weapons were filled with agents,
    - The unilateral destruction of 15, 620 weapons, and the fate of 16,038 additional weapons Iraq claimed it had discarded. "The margin of error" in the accounting presented by Iraq is in the neighborhood of 200 munitions."
    - Iraq systematically lied about the existence of its production facilities for VX gas until 1995, and made "significant efforts" to conceal its production capabilities after that date. Uncertainties affecting the destruction of its VX gas still affect some 750 tons of imported precursor chemicals, and 55 tons of domestically produced precursors. Iraq has made unverifiable claims that 460 tons were destroyed by Coalition air attacks, and that it unilaterally destroyed 212 tons. UNSCOM has only been able to verify the destruction of 155 tons and destroy a further 36 tons on its own.
- Iraq has developed basic chemical warhead designs for Scud missiles, rockets, bombs, and shells. Iraq also has spray dispersal systems.
- Iraq maintains extensive stocks of defensive equipment.

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- The UN feels that Iraq is not currently producing chemical agents, but Iraq has offered no evidence that it has destroyed its VX production capability and/or stockpile. Further, Iraq retains the technology it acquired before the war and evidence clearly indicates an ongoing research and development effort, in spite of the UN sanctions regime.
- Recent UNSCOM work confirms that Iraq did deploy gas-filled 155 mm artillery and 122 mm multiple rocket rounds into the rear areas of the KTO during the Gulf War.
- Iraq's chemical weapons had no special visible markings, and were often stored in the same area as conventional weapons.
- Iraq has the technology to produce stable, highly lethal VX gas with long storage times.
- May have developed improved binary and more stable weapons since the Gulf War.
- Since 1992, Iraq attempted to covertly import precursors and production equipment for chemical weapons through Qatar, Saudi Arabia, and Jordan since the Gulf War.
- The current status of the Iraqi program is as follows (according to US intelligence as of February 19, 1998 and corrected by the National Intelligence Council on November 16, 1998):

Agent	Declared	Potential Unaccounted For	Comments
Chemical Agents	(Metric Tons)	(Metric Tons)	
VX Nerve Gas	3	300	Iraq lied about the program until 1995
G Agents (Sarin)	100-150	200	Figures include weaponized and bulk agents
Mustard Gas	500-600	200	Figures include weaponized and bulk agents
Delivery Systems	(Number)	(Number)	
Missile Warheads	75-100	2-25	UNSCOM supervised destruction of 30
Rockets	100,000	15,000-25,000	UNSCOM supervised destruction of 40,000, 28,000 of which were filled.
Aerial Bombs	16,000	2,000-8,000	High estimate reflects the data found in an Iraqi Air Force document in July, 1998.
Artillery shells	30,000	15,000	
Aerial Spray Tanks	?	?	

- A US State Department spokesman reported on November 16, 1998 that Iraq has reported making 8,800 pounds (four tons) of VX nerve gas, 220,000 pounds (100 tons) to 330,000 pounds (150 tons) of nerve agents such as Sarin and 1.1 million pounds (500 tons) to 1.32 million pounds (600 tons) of mustard gas. Data from UN weapons inspectors indicates that Iraq may have produced an additional 1.32 million pounds (600-tons) of these agents, divided evenly among the three. ``In other words, these are the differences between what they say they have and what we have reason to believe they have."
- The CIA reported in January 1999 that Iraq had purchased numerous dual-use items for legitimate civilian projects—in principle subject to UN scrutiny—that also could be diverted for WMD purposes. Since the Gulf war, Baghdad has rebuilt key portions of its chemical production infrastructure for industrial and commercial use. Some of these facilities could be converted fairly quickly for production of CW agents. The recent discovery that Iraq had weaponized the advanced nerve agent VX and the convincing evidence that fewer CW munitions were consumed during the Iran-Iraq war than Iraq had declared provide strong indications that Iraq retains a CW capability and intends to reconstitute its pre-Gulf war capability as rapidly as possible once sanctions are lifted.
- A State Department report in September 1999 noted that:
  - In July 1998, Iraq seized from the hands of UNSCOM inspectors an Iraqi Air Force document indicating that Iraq had misrepresented the expenditure of over 6,000 bombs which may have contained over 700 tons of chemical agent. Iraq continues to refuse to provide this document to the UN.

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  - Iraq continues to deny weaponizing VX nerve agent, despite the fact that UNSCOM found VX nerve agent residues on Iraqi SCUD missile warhead fragments. Based on its investigations, international experts concluded that "Iraq has the know-how and process equipment, and may possess precursors to manufacture as much as 200 tons of VX ... The retention of a VX capability by Iraq cannot be excluded by the UNSCOM international expert team."

- The DCI Nonproliferation Center (NPC) reported in February 2000 that "We do not have any direct evidence that Iraq has used the period since Desert Fox to reconstitute its WMD programs, although given its past behavior, this type of activity must be regarded as likely. The United Nations assesses that Baghdad has the capability to reinitiate both its CW and BW programs within a few weeks to months, but without an inspection monitoring program, it is difficult to determine if Iraq has done so." It also reported that,
  - Since Operation Desert Fox in December 1998, Baghdad has refused to allow United Nations inspectors into Iraq as required by Security Council Resolution 687. As a result, there have been no UN inspections during this reporting period, and the automated video monitoring system installed by the UN at known and suspect WMD facilities in Iraq has been dismantled by the Iraqis. Having lost this on-the-ground access, it is difficult for the UN or the US to accurately assess the current state of Iraq's WMD programs.
  - Since the Gulf war, Iraq has rebuilt key portions of its chemical production infrastructure for industrial and commercial use, as well as its missile production facilities. It has attempted to purchase numerous dual-use items for, or under the guise of, legitimate civilian use. This equipment-in principle subject to UN scrutiny-also could be diverted for WMD purposes. Following Desert Fox, Baghdad again instituted a reconstruction effort on those facilities destroyed by the US bombing, to include several critical missile production complexes and former dual-use CW production facilities. In addition, it appears to be installing or repairing dual-use equipment at CW-related facilities. Some of these facilities could be converted fairly quickly for production of CW agents.
- The United Nations Special Commission on Iraq (UNSCOM) reported to the Security Council in December 1998 that Iraq continued to withhold information related to its CW and BW programs. For example, Baghdad seized from UNSCOM inspectors an Air Force document discovered by UNSCOM that indicated that Iraq had not consumed as many CW munitions during the Iran-Iraq War in the 1980s as declared by Baghdad. This discrepancy indicates that Iraq may have an additional 6,000 CW munitions hidden. This intransigence on the part of Baghdad ultimately led to the Desert Fox bombing by the US.
- Iraqi defector claims in February 2000 that Iraq had maintained a missile force armed with chemical and biological warheads that can bee deployed from secret locations, and they that warheads are stored separately near Baghdad and have been deployed to the missiles in the field in exercises.481
- A CIA report in August 2000 summarized the state of chemical weapons proliferation in Iraq as follows,482
- Since Operation Desert Fox in December 1998, Baghdad has refused to allow United Nations inspectors into Iraq as required by Security Council Resolution 687. Although UN Security Council Resolution (UNSCR) 1284, adopted in December 1999, established a follow-on inspection regime to the United Nations Special Commission on Iraq (UNSCOM) in the form of the United Nations Monitoring, Verification, and Inspection Committee (UNMOVIC), there have been no UN inspections during this reporting period. Moreover, the automated video monitoring system installed by the UN at known and suspect WMD facilities in Iraq has been dismantled by the Iraqis. Having lost this on-the-ground access, it is difficult for the UN or the US to accurately assess the current state of Iraq's WMD programs.
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Biological Weapons

- Had highly compartmented "black" program with far tighter security regulations than chemical program.
- Had 18 major sites for some aspect of biological weapons effort before the Gulf War. Most were nondescript and had no guards or visible indications they were a military facility.
- The US targeted only one site during the Gulf War. It struck two sites, one for other reasons. It also struck at least two targets with no biological facilities that it misidentified.
- Systematically lied about biological weapons effort until 1995. First stated that had small defensive efforts, but no offensive effort. In July, 1995, admitted had a major defensive effort. In October, 1995, finally admitted major weaponization effort.
- Iraq has continued to lie about its biological weapons effort since October, 1995. It has claimed the effort was headed by Dr. Taha, a woman who only headed a subordinate effort. It has not admitted to any help by foreign personnel or contractors. It has claimed to have destroyed its weapons, but the one site UNSCOM inspectors visited showed no signs of such destruction and was later said to be the wrong site. It has claimed only 50 people were employed full time, but the scale of the effort would have required several hundred.
- Since July 1995, Iraq has presented three versions of FFCDs and four "drafts."
    - The most recent FFCD was presented by Iraq on 11 September 1997. This submission followed the UNSCOM's rejection, of the FFCD of June 1996. In the period since receiving that report, UNSCOM conducted eight inspections in an attempt to investigate critical areas of Iraq's proscribed activities such as warfare agent production and destruction, biological munitions manufacturing, filling and destruction, and military involvement in and support to the proscribed program. Those investigations, confirmed the assessment that the June 1996 declaration was deeply deficient. The UNSCOM concluded that the new FFCD, it received on 11 September 1997, contains no significant changes from the June 1996 FFCD
- Iraq has not admitted to the production of 8,500 liters of anthrax, 19,000 liters of Botulinum toxin, 2,200 liters of Aflatoxin,
- Reports indicate that Iraq tested at least 7 principal biological agents for use against humans.
    - Anthrax, Botulinum, and Aflatoxin are known to be weaponized.
    - Looked at viruses, bacteria, and fungi. Examined the possibility of weaponizing gas gangrene and Mycotoxins. Some field trials were held of these agents.
    - Examined foot and mouth disease, haemorrhagic conjunctivitis virus, rotavirus, and camel pox virus.
    - Conducted research on a "wheat pathogen" and a Mycotoxin similar to "yellow rain" defoliant.
    - The "wheat smut" was first produced at Al Salman, and then put in major production during 1987-1988 at a plant near Mosul. Iraq claims the program was abandoned.
- The August 1995 defection of Lieutenant general Husayn Kamel Majid, formerly in charge of Iraq's weapons of mass destruction, revealed the extent of this biological weapons program. Lt. General Kamel's defection prompted Iraq to admit that it:

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- Imported 39 tons of growth media (31,000 kilograms or 68,200 pounds) for biological agents obtained from three European firms. According to UNSCOM, 3,500 kilograms or 7,700 pounds) remains unaccounted for. Some estimates go as high as 17 tons. Each ton can be used to produce 10 tons of bacteriological weapons.
- Imported type cultures from the US which can be modified to develop biological weapons.
- Had a laboratory- and industrial-scale capability to manufacture various biological agents including the bacteria which cause Anthrax and botulism; Aflatoxin, a naturally occurring carcinogen; clostridium perfringens, a gangrene-causing agent; the protein toxin Ricin; tricothecene Mycotoxins, such as T-2 and DAS; and an anti-wheat fungus known as wheat cover smut. Iraq also conducted research into the rotavirus, the camel pox virus and the virus which causes haemorrhagic conjunctivitis.
- Created at least seven primary production facilities including the Sepp Institute at Muthanna, the Ghazi Research Institute at Amaria, the Daura Foot and Mouth Disease Institute, and facilities at Al-Hakim, Salman Pak Taji, and Fudaliyah. According to UNSCOM, weaponization occurred primarily at Muthanna through May, 1987 (largely Botulinum), and then moved to Al Salman. (Anthrax). In March, 1988 a plant was open at Al Hakim, and in 1989 an Aflatoxin plant was set up at Fudaliyah.
- Had test site about 200 kilometers west of Baghdad, used animals in cages and tested artillery and rocket rounds against live targets at ranges up to 16 kilometers.
- Took fermenters and other equipment from Kuwait to improve effort during the Gulf War.
- Iraq had least 79 civilian facilities capable of playing some role in biological weapons production still in existence in 1997.

- The Iraqi program involving Aflatoxin leaves many questions unanswered.
  - Iraqi research on Aflatoxin began in May 1988 at Al Salman, where the toxin was produced by the growth of fungus aspergilus in 5.3 quart flasks.
  - The motives behind Iraq's research on Aflatoxin remain one of the most speculative aspects of its program. Aflatoxin is associated with fungal-contaminated food grains, and is considered non-lethal. It normally can produce liver cancer, but only after a period of months to years and in intense concentrations. There is speculation, however, that a weaponized form might cause death within days and some speculation that it can be used as an incapacitating agent.
  - Iraq moved its production of Aflatoxin to Fudaliyah in 1989, and produced 481 gallons of toxin in solution between November, 1988 and May, 1990.
  - It developed 16 R-400 Aflatoxin bombs and two Scud warheads. Conducted trials with Aflatoxin in 122 mm rockets and R-400 bombs in November 1989 and May and August 1990. Produced a total of 572 gallons of toxin and loaded 410.8 gallons into munitions.
  - UNSCOM concluded in October, 1997, that Iraq's accounting for its Aflatoxin production was not credible.
- Total Iraqi production of more orthodox biological weapons reached at least 19,000 liters of concentrated Botulinum (10,000 liters filled into munitions); 8,500 liters of concentrated Anthrax (6,500 liters filled into munitions); and 2,500 liters of concentrated Aflatoxin (1,850 liters filled into munitions).
  - It manufactured 6,000 liters of concentrated Botulinum toxin and 8,425 liters of Anthrax at Al-Hakim during 1990; 5400 liters of concentrated Botulinum toxin at the Daura Foot and Mouth Disease Institute from November 1990 to January 15, 1991; 400 liters of concentrated Botulinum toxin at Taji; and 150 liters of concentrated Anthrax at Salman Pak.
  - Iraq is also known to have produced at least:
    - 1,850 liters of Aflatoxin in solution at Fudaliyah.
    - 340 liters of concentrated clostridium perfringens, a gangrene-causing biological agent, beginning in August 1990.
    - 10 liters of concentrated Ricin at Al Salam. Claim abandoned work after tests failed.

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- Iraq weaponized at least three biological agents for use in the Gulf War. The weaponization consisted of at least:
    - 100 bombs and 16 missile warheads loaded with Botulinum.
    - 50 R-400 air-delivered bombs and 5 missile warheads loaded with anthrax; and
    - 4 missile warheads and 7 R-400 bombs loaded with Aflatoxin, a natural carcinogen.
    - The warheads were designed for operability with the Al Husayn Scud variant.
- Iraq had other weaponization activities:
    - Armed 155 mm artillery shells and 122 mm rockets with biological agents.
    - Conducted field trials, weaponization tests, and live firings of 122 mm rockets armed with Anthrax and Botulinum toxin from March 1988 to May 1990.
    - Tested Ricin, a deadly protein toxin, for use in artillery shells.
    - Iraq produced at least 191 bombs and 25 missile warheads with biological agents.
    - Developed and deployed 250 pound aluminum bombs coverage in fiberglass. Bombs were designed so they could be mounted on both Soviet and French-made aircraft. They were rigged with parachutes for low altitudes drops to allow efficient slow delivery and aircraft to fly under radar coverage. Some debate over whether bombs had cluster munitions or simply dispersed agent like LD-400 chemical bomb.
    - Deployed at least 166 R-400 bombs with 85 liters of biological agents each during the Gulf War. Deployed them at two sites. One was near an abandoned runway where it could fly in aircraft, arm them quickly, and disperse with no prior indication of activity and no reason for the UN to target the runway.
    - Filled at least 25 Scud missile warheads, and 157 bombs and aerial dispensers, with biological agents during the Gulf War.
- Developed and stored drop tanks ready for use for three aircraft or RPV s with the capability of dispersing 2,000 liters of anthrax. Development took place in December 1990. Claimed later that tests showed the systems were ineffective.
    - The UN found, however, that Iraq equipped crop spraying helicopters for biological warfare and held exercises and tests simulating the spraying of Anthrax spores.
    - Iraqi Mirages were given spray tanks to disperse biological agents.
        - Held trials as late as January 13, 1991.
        - The Mirages were chosen because they have large 2,200 liter belly tanks and could be refueled by air, giving them a longer endurance and greater strike range.
        - The tanks had electric valves to allow the agent to be released and the system was tested by releasing simulated agent into desert areas with scattered petri dishes to detect the biological agent. UNSCOM has video tapes of the aircraft.
- Project 144 at Taji produced at least 25 operational Al Husayn warheads. Ten of these were hidden deep in a railway tunnel, and 15 in holes dug in an unmanned hide site along the Tigris.
- Biological weapons were only distinguished from regular weapons by a black stripe.
- The UN claims that Iraq has offered no evidence to corroborate its claims that it destroyed its stockpile of biological agents after the Gulf War. Further, Iraq retains the technology it acquired before the war and evidence clearly indicates an ongoing research and development effort, in spite of the UN sanctions regime.
- UNSCOM reported in October 1997 that:
    - Iraq has never provided a clear picture of the role of its military in its biological warfare program, and has claimed it only played a token role.
    - It has never accounted for its disposal of growth media. The unaccounted for media is sufficient, in quantity, for the production of over three times more of the biological agent -- Anthrax -- Iraq claims to have been produced.

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- Bulk warfare agent production appears to be vastly understated by Iraq. Expert calculations of possible agent production quantities, either by equipment capacity or growth media amounts, far exceed Iraq's stated results
- Significant periods when Iraq claims its fermenters were not utilized are unexplained
- Biological warfare field trials are underreported and inadequately described.
- Claims regarding field trials of chemical and biological weapons using R400 bombs are contradictory and indicate that, "more munitions were destroyed than were produced.
- The Commission is unable to verify that the unilateral destruction of the BW-filled Al Hussein warheads has taken place."
- There is no way to confirm whether Iraq destroyed 157 bombs of the R400 type, some of which were filled with Botulin or anthrax spores.
- "The September 1997 FFCD fails to give a remotely credible account of Iraq's biological program. This opinion has been endorsed by an international panel of experts."

- The current status of the Iraqi program is as follows (according to US intelligence as of February 19, 1998):

Agent	Declared Concentrated Amount		Declared Total Amount		Uncertainty	
	Liters	Gallons	Liters	Gallons		
Anthrax	8500	12,245	85000	22457		Could be 3-4 times declared amount
Botulinum toxin	19,400	NA	380,000	NA		Probably twice declared amount. Some extremely concentrated.
Gas Gangrene Clostridium Perfingens	340	90	3,400	900		Amounts could be higher
Aflatoxin	NA	NA	2,200	581		Major uncertainties
Ricin	NA	NA	10	2.7		Major uncertainties

- UNSCOM cannot confirm the unilateral destruction of 25 warheads. It can confirm the destruction of 23 of at least 157 bombs. Iraq may have more aerosol tanks.
- UN currently inspects 79 sites -- 5 used to make weapons before war; 5 vaccine or pharmaceutical sites; 35 research and university sites; thirteen breweries, distilleries, and dairies with dual-purpose capabilities; eight diagnostic laboratories.
- Iraq retains laboratory capability to manufacture various biological agents including the bacteria which cause anthrax, botulism, tularemia and typhoid.
- Many additional civilian facilities are capable of playing some role in biological weapons production.
- A State Department spokesman reported on November 16, 1998 that there is a large discrepancy between the amount of biological growth media -procured and the amount of agents that were or could have been produced. Baghdad has not adequately explained where some 8,000 pounds (3,500 kg) of the material went out of some 68,000 pounds (31,000 kg) of biological growth media it imported. Iraq's accounting of the amount of the agent it produced and the number of failed batches is seriously flawed and cannot be reconciled on the basis of this full disclosure Iraq has made.
- The CIA reported in January 1999 that Iraq continues to refuse to disclose fully the extent of its BW program. After four years of denials, Iraq admitted to an offensive program resulting in the destruction of Al Hakam-a large BW production facility Iraq was trying to hide as a legitimate biological plant. Iraq still has not accounted for over a hundred BW bombs and over 80 percent of imported growth media-directly related to past and future Iraqi production of thousands of gallons

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of biological agent. This lack of cooperation is an indication that Baghdad intends to reconstitute its BW capability when possible.

- A State Department report in September 1999 noted that:
  - Iraq refuses to allow inspection of thousands of Ministry of Defense and Military Industries Commission documents relating to biological and chemical weapons and long-range missiles.
  - In 1995, Iraqis who conducted field trials of R-400 bombs filled with biological agents described the tests to UNSCOM experts in considerable detail, including the use of many animals. These field trials were reflected in Iraq's June 1996 biological weapons declaration. Yet, amazingly, Iraq now denies that any such trials were conducted at all.
  - In September 1995, Iraq finally declared the existence of two projects to disseminate biological agents from Mirage F-1 and MiG-21 aircraft, yet there is no evidence that the prototype weapons and aircraft were ever destroyed. There is also no evidence that the 12 Iraqi helicopter-borne aerosol generators for biological weapon delivery were ever destroyed.
  - Apart from one document referring to a single year, no Iraqi biological weapon production records have been given to the UN—no records of storage, of filling into munitions, or of destruction. This is why UNSCOM refers to Iraq's biological weapons program—which deployed SCUD missile warheads filled with anthrax and botulinum toxin to be ready for use against Coalition forces—as a "black hole."
  - The Iraqis have repeatedly changed their story about their biological weapons warheads. Iraq has revised several times its declarations regarding the precise locations of warhead destruction and the fill of warheads. The movements of concealed warheads prior to unilateral destruction, claimed by Iraq, have been proven to be false.
- The DCI Nonproliferation Center (NPC) reported in February 2000 that "We do not have any direct evidence that Iraq has used the period since Desert Fox to reconstitute its WMD programs, although given its past behavior, this type of activity must be regarded as likely. The United Nations assesses that Baghdad has the capability to reinitiate both its CW and BW programs within a few weeks to months, but without an inspection monitoring program, it is difficult to determine if Iraq has done so."
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Nuclear Weapons

- Inspections by UN teams have found evidence of two successful weapons designs, a neutron initiator, explosives and triggering technology needed for production of bombs, plutonium processing technology, centrifuge technology, Calutron enrichment technology, and experiments with chemical separation technology. Iraq had some expert technical support, including at least one German scientist who provided the technical plans for the URENCO TC-11 centrifuge.
- Iraq's main nuclear weapons related facilities were:
    - Al Atheer - center of nuclear weapons program. Uranium metallurgy; production of shaped charges for bombs, remote controlled facilities for high explosives manufacture.
    - Al Tuwaitha - triggering systems, neutron initiators, uranium metallurgy, and hot cells for plutonium separation. Laboratory production of UO_2, UCL_4, UF_6, and fuel fabrication facility. Prototype-scale gas centrifuge, prototype EMIS facility, and testing of laser isotope separation technology.
    - Al Qa Qa - high explosives storage, testing of detonators for high explosive component of implosion nuclear weapons.
    - Al Musaiyib/Al Hatteen - high explosive testing, hydrodynamic studies of bombs.
    - Al Hadre - firing range for high explosive devices, including FAE.
    - Ash Sharqat - designed for mass production of weapons grade material using EMIS.
    - Al Furat - designed for mass production of weapons grade material using centrifuge method.
    - Al Jesira (Mosul) - mass production of UCL_4.
    - Al Qaim - phosphate plant for production of U308.
    - Akashat uranium mine.
- Iraq had three reactor programs:
    - Osiraq/Tammuz I 40 megawatt light-water reactor destroyed by Israeli air attack in 1981.
    - Isis/Tammuz II 800 kilowatt light water reactor destroyed by Coalition air attack in 1991.
    - IRT-5000 5 megawatt light water reactor damaged by Coalition air attack in 1991.
- Iraq used Calutron (EMIS), centrifuges, plutonium processing, chemical defusion and foreign purchases to create new production capability after Israel destroyed most of Osiraq.
- Iraq established a centrifuge enrichment system in Rashidya and conducted research into the nuclear fuel cycle to facilitate development of a nuclear device.
- After invading Kuwait, Iraq attempted to accelerate its program to develop a nuclear weapon by using radioactive fuel from French and Russian-built reactors. It made a crash effort in September, 1990 to recover enriched fuel from its supposedly safe-guarded French and Russian reactors, with the goal of producing a nuclear weapon by April, 1991. The program was only halted after Coalition air raids destroyed key facilities on January 17, 1991.

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- Iraq conducted research into the production of a radiological weapon, which disperses lethal radioactive material without initiating a nuclear explosion.
    - Orders were given in 1987 to explore the use of radiological weapons for area denial in the Iran-Iraq War.
    - Three prototype bombs were detonated at test sites -- one as a ground level static test and two others were dropped from aircraft.
    - Iraq claims the results were disappointing and the project was shelved but has no records or evidence to prove this.
- UN teams have found and destroyed, or secured, new stockpiles of illegal enriched material, major production and R&D facilities, and equipment-- including Calutron enriching equipment.
- UNSCOM believes that Iraq's nuclear program has been largely disabled and remains incapacitated, but warns that Iraq retains substantial technology and established a clandestine purchasing system in 1990 that it has used to import forbidden components since the Gulf War.
- The major remaining uncertainties are:
    - Iraq still retains the technology developed before the Gulf War and US experts believe an ongoing research and development effort continues, in spite of the UN sanctions regime.
    - Did Iraq conceal an effective high speed centrifuge program.
    - Are there elements for radiological weapons.
    - Is it actively seeking to clandestinely buy components for nuclear weapons and exami9ning the purchase of fissile material from outside Iraq.
    - Is it continuing with the development of a missile warhead suited to the use of a nuclear device.
    - A substantial number of declared nuclear weapons components and research equipment has never been recovered. There is no reason to assume that Iraqi declarations were comprehensive.
- The CIA reported in January 1999 that Iraq continues to hide documentation, and probably some equipment, relating to key aspects of past nuclear activities. After years of Iraqi denials, the IAEA was able to get Iraq to admit to a far more advanced nuclear weapons program and a project based on advanced uranium enrichment technology. However, Baghdad continues to withhold significant information about enrichment techniques, foreign procurement, and weapons design.
- The DCI Nonproliferation Center (NPC) reported in February 2000 that "We do not have any direct evidence that Iraq has used the period since Desert Fox to reconstitute its WMD programs, although given its past behavior, this type of activity must be regarded as likely. The United Nations assesses that Baghdad has the capability to reinitiate both its CW and BW programs within a few weeks to months, but without an inspection monitoring program, it is difficult to determine if Iraq has done so."
- Press reports in February 2000 claimed that Iraq might have developed biological warfare agents it had kept secret from UNSCOM inspectors and which were never discovered. The reports followed similar warnings by UNSCOM experts on January 25, 2000 that Iraq might have done so, that not all suspected biological weapons production and research facilities had been inspected, and that the undiscovered weapons might include infectious viral agents.485

Source: Prepared by Anthony H. Cordesman, Co-Director, Middle East Program, CSIS.

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Proliferation is a Supply, as Well as Demand, Driven Issue

The US and Israeli focus on proliferation in Iran and Iraq sometimes disguises the fact that proliferation is becoming globalized as well as regionalized. As the previous analysis has shown, Russia, China, and North Korea continue to be major sources of weapons, equipment, and technology that can be used to create and deliver chemical, biological, radiological, and nuclear weapons. The latest unclassified publications of the CIA track a continuing transfer of such technology into the Gulf, and it is supplemented by major transfers of dual-use and smuggled technology out of the West and the rest of Asia.[486]

A recent CIA analysis describes the role of global suppliers as follow: [487]

"….Russian entities during the reporting period continued to supply a variety of ballistic missile-related goods and technical know-how to countries such as Iran, India, and Libya. Iran's earlier success in gaining technology and materials from Russian entities accelerated Iranian development of the Shahab-3 MRBM, which was first flight-tested in July 1998. Russian entities during the second six months of 1999 have provided substantial missile-related technology, training, and expertise to Iran that almost certainly will continue to accelerate Iranian efforts to develop new ballistic missile systems.

"During the second half of 1999, Russia also remained a key supplier for civilian nuclear programs in Iran, primarily focused on the Bushehr Nuclear Power Plant project. With respect to Iran's nuclear infrastructure, Russian assistance enhances Iran's ability to support a nuclear weapons development effort. By its very nature, even the transfer of civilian technology may be of use in Iran's nuclear weapons program. We remain concerned that Tehran is seeking more than a buildup of its civilian infrastructure, and the IC will be closely monitoring the relationship with Moscow for any direct assistance in support of a military program. In addition, Russia supplied India with material for its civilian nuclear program during this reporting period.

"Russian entities remain a significant source of biotechnology and chemicals for Iran. Russia's world-leading expertise in biological and chemical weapons would make it an attractive target for Iranians seeking technical information and training on BW and CW agent production processes.

"Russia (along with its sister republics in the FSU) also remains an important source of conventional weapons and spare parts for Iran, which is seeking to upgrade and replace its existing conventional weapons inventories.

"… the Russian government's commitment, willingness, and ability to curb proliferation-related transfers remain uncertain. Moreover, economic conditions in Russia continued to deteriorate, putting more pressure on Russian entities to circumvent export controls. Despite some examples of restraint, Russian businesses continue to be major suppliers of WMD equipment, materials, and technology to Iran. Specifically, Russia continues to provide Iran with nuclear technology that could be applied to Iran's weapons program. Monitoring Russian proliferation behavior, therefore, will remain a very high priority.

"…Throughout the second half of 1999, North Korea continued to export significant ballistic missile-related equipment and missile components, materials, and technical expertise to countries in the Middle East, South Asia, and North Africa. Pyongyang attaches a high priority to the development and sale of ballistic missiles, equipment, and related technology. Exports of ballistic missiles and related technology are one of the North's major sources of hard currency, which fuel continued missile development and production.

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> "…Chinese missile-related technical assistance to Pakistan increased during this reporting period. In addition, firms in China provided missile-related items, raw materials, and/or assistance to several countries of proliferation concern—such as Iran, North Korea, and Libya.
>
> "…China's 1997 pledge not to engage in any new nuclear cooperation with Iran has apparently held, but work associated with two remaining nuclear projects—a small research reactor and a zirconium production facility—continues. The Intelligence Community will continue to monitor carefully Chinese nuclear cooperation with Iran.
>
> "Prior to the reporting period, Chinese firms had supplied CW-related production equipment and technology to Iran. The US sanctions imposed in May 1997 on seven Chinese entities for knowingly and materially contributing to Iran's CW program remain in effect. Evidence during the current reporting period suggests Iran continues to seek such assistance from Chinese entities, but it is unclear to what extent these efforts have succeeded. In June 1998, China announced that it had expanded its chemical export controls to include 10 of the 20 Australia Group chemicals not listed on the CWC schedules.
>
> "…As was the case in 1998, entities in Western countries in 1999 were not as important as sources for WMD-related goods and materials as in past years —with the exceptions of Iran and Libya, where entities in Western European countries in particular remain significant suppliers for their WMD programs.

As the previous chapters have shown, these trends show that the US must do far more than simply try to enforce sanctions at the buyer level. It must keep up constant diplomatic pressure on suppliers and consider sanctions as well.

The Meaning of the Globalization and Regionalization of Proliferation for Gulf Defense

There is little present prospect for the effective globalization or regionalization of arms control, and there is a near certain prospect that Iran and Iraq will acquire more sophisticated and lethal weapons of mass destruction and long range delivery systems. In the process, they will acquire weapons that they can use to strike with precision at critical strategic targets like oil shipments, desalination plants, etc. At the same time, the spread of biotechnology, petrochemical technology, food processing technology, fermenters, and pharmaceutical technology will steadily increase regional capabilities to produce advanced biological weapons that are storable, resistant to heat and light, and have nuclear lethalities.

Iran and Iraq do face international sanctions, and/or are signatories to arms control agreements that have such sanctions. The irony is that the "globalism" of arms control provides a strong incentive to keep their efforts covert. The good news is that such constraints have often reduced their rate of activity and success, and have sharply increased the cost of acquiring and deploying key threats like nuclear weapons. The bad news is that nations like India and Pakistan

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have shown such barriers do not block military change, and nations like Iran and Iraq, continue to acquire new technology necessary to improve their capabilities.[488]

In practice, this means that the US and its Gulf allies will probably face the following continuing problems dealing with proliferation:

- *Making weapons of mass destruction an international norm:* As the Iran-Iraq War has shown, the present political barriers to the use of weapons of mass destruction are tenuous and can vanish under the pressure of war. The Gulf War showed that missile attacks against population centers and "horizontal escalation" are very real threats, and the course of the Gulf War might well have led to the widespread use of weapons of mass destruction if it had occurred several years later. There is a serious risk that a new conflict using weapons of mass destruction – such as a nuclear conflict between India and Pakistan – could suddenly "legitimize" both proliferation and the use of weapons of mass destruction in the sense that it could become a new "norm" for many developing countries.

- *Proliferating global "breakout capabilities:* Proliferation has been slowed down in the past by the difficulties in acquiring nuclear weapons, and in weaponizing chemical and biological weapons with real effectiveness. Some of these trends may continue. While most powers can now design fission and boosted weapons, there has been only limited progress in the technology needed to develop fissile material. This situation seems likely to continue, although the acquisition of high speed centrifuge technology, the technology needed to build small reactors designed the produce plutonium, or fissile material from the FSU present continuing risks. It would take the collapse of the political restraints enforced by the NNPT, and a major increase in supplier willingness to sell relevant technologies to radically change the present mix of risks the US faces.

- *Similar constraints do not apply to chemical and biological weapons*. The global spread of biotechnology, more food processing facilities, fertilizer plants, and petrochemical plants is slowly giving a wide range of nations the ability to manufacture advanced chemical and biological weapons. Moreover, the spread of missile warhead, cluster munition, sprayer, and UAV technology is simplifying the weaponization of such weapons.

- *The risk posed by biotechnology*: Modern biological weapons can easily be as lethal as fission and boosted weapons. They can also be used to attack in ways that incapacitate or threaten the agricultural sector, or modified – with or without genetic engineering – to defeat current vaccines and medical treatment. "Globalization" is making such weapons steadily cheaper and more accessible, and is creating a wide range of national research and production capabilities that can mass produce such weapons with only a limited chance of detection. There is a high probability that the threat of nuclear proliferation, which dominated the "globalism" of the last half of the 20th Century will be matched or surpassed by the threat posed by the globalization of biotechnology.

- *Long-range strike systems:* Iran, and Iraq are demonstrating that developing states can acquire the technology to produce missile boosters capable of launching weapons of mass destruction with enough accuracy to hit city-sized targets at ranges of more than 1,000 miles, and eventually to intercontinental ranges. At the same time, the proliferation of GPS guidance systems and specialized commercial jet engines is greatly reducing the cost of developing and producing cruise missiles with ranges in excess of 600 miles.[489]

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- *Weapons of mass destruction and asymmetric warfare:* The technologies and weapons necessary to carry out covert and proxy attacks using weapons of mass destruction are far cheaper than those required to use ballistic and cruise missiles. They are also becoming available to non-state actors like terrorists and extremists, and such attacks offer the potential ability to attack without attribution.

- *Homeland and allied defense:* All of these risks combine to create a need for homeland defense that most western states have not seriously contemplated since the early days of the thermonuclear era and that Southern Gulf states have just begun to consider. It is far from clear that Iran and Iraq will have the kind of political leadership that is as subject to rationale deterrence as Russia. Certainly, Iraq has been erratic enough in the past to create serious concerns about their conduct, and even a "rational" Iran might become involved in a process of escalation that ended in little restraint. The practical problem is that there are many forms of attack that could be used that do not require an overt declaration of war or clearly identify the attacker, and that the most costly form of defense – national and theater missile defenses – deal with only the most costly and overt form of attack. As a result, effective counterproliferation may require a global shift to a broad mix of costly homeland defense measures ranging from missile defense and counterproliferation to response measures designed to limit damage and deal with its effects.

There are no certainties involved in any of these threats. It is impossible to assign reliable probabilities to their nature, timing, or effectiveness, and it is at least possible that diplomacy, political change, and economic development may reduce them, roll them back, or at least prevent the emergence of major paradigm shifts. It is equally possible, however, that they will interact to create the same broad changes in the military environment in the Gulf as the more "conventional" aspects of asymmetric warfare.[490]

It is also a grim fact of life that this particular brave new world can interact disastrously with the world's dependence on Gulf energy exports, and with the growth of far more lethal forms of asymmetric warfare and terrorism. The energy facilities of the Middle East are already often highly lucrative targets. The hyperurbanization of the Gulf, usually with one key urban area that defines the political structure of each country, makes most Gulf nations "one-bomb states." The use of such weapons would also force the near or total collapse of most regional economies. The end result that proliferating states may be able to conduct "wars of intimidation" against those states that cannot retaliate or which are not supported by defenses and outside deterrents. If such weapons are ever actually used, the result may be a form of "globalization" that sinks all boats rather than raising them.

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US Counterproliferation Capabilities

Table IX-3 illustrates just how lethal future Iranian and Iraqi capabilities can be. The chemical weapons in this table may not have anything approaching the destructive power of biological and nuclear weapons. However, they cannot be disregarded -- particularly if an attacking state should use aircraft or cruise missiles to deliver such weapons in aerosol form -- rather than in the far less lethal form likely to result from ballistic missile attacks. Chemical weapons could still radically alter the nature of the escalation and targeting in a future Gulf conflict. At the same time, they cannot threaten the survival of states in their current form.

In contrast, biological weapons are a true weapon of mass destruction. They can be as destructive as small nuclear weapons, and both Iran and Iraq have biological weapons efforts. Further, covert delivery of such weapons is by far the most lethal way of using them. It would take a very advanced ballistic missile warhead to disseminate a survivable and fully lethal biological agent over a wide area at the right height. At the same time, crude unconventional delivery systems like releasing a biological agent from a ship, roof top, or commercial aircraft can be very effective.

The US, for example, experimented during the Cold War by dispersing inert particulate matter the same size and weight as Anthrax spores. It delivered such spores from commercial vessels moving along the coast of New Jersey and in “terrorist” attacks sprinkling the spores over commuters rushing home through Grand Central Station in New York. Both dissemination systems were very effective and would have produced very high death rates. Both would have required human intelligence identifying the attackers in advance to prevent heavy losses. Metal detectors and other technological means would not have been effective, and most conventional anti-terrorist protective measures would have failed.

The effects of biological and nuclear weapons should not be exaggerated, a single nuclear device could destroy a majority of the population, particularly under conditions where increases in the long-term death rate were included in the estimate of casualties shown in Table IX-3 -- which

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only includes short-term deaths within a 48 hour to seven day period. At the same time, a nuclear attack on the capital of any of the states just listed could destroy its current political leadership, much of its economy, and a great deal of the state's cohesion and national identity. Recovery would be questionable, and the social and economic impact of any such strike would last a decade or more.

Advances in technology also present growing problems. There have been no breakthroughs in the production of fissile material, but there is a vast amount of fissile material in the former Soviet Union, and more and more countries could produce an aircraft deliverable nuclear device in a matter of a few months or years if they could buy weapons-grade material. The very nature of biotechnology means all of the countries in the Middle East are steadily acquiring the capability to make extremely lethal, dry-storable biological weapons, and to do so with fewer and fewer indicators in terms of imports of specialized technology, with more use of dual-use or civilian production facilities, and in smaller spaces.

All of these developments have dangerous war-fighting effects. Nations like Iran and Iraq that are in the process of acquiring a few nuclear weapons or serious biological weapons tend to see wars involving such weapons in terms of threats to enemy population centers and often feel they have little option other than to strike or concede if intimidation fails. They also keep their capabilities covert, and scarcely debate the potential use of such weapons as part of their normal process of decision making. This approach to acquiring truly lethal weapons of mass destruction can lead to rapid massive escalation or surprise attacks -- particularly if Iran or Iraq fears preemption, structures its forces to launch under attack, and/or seeks to strike before its opponent can bring its retaliatory forces and air and missile defenses to full readiness. Fewer weapons do not mean great stability and security, and they almost inevitably mean counter-value targeting.

As the East-West arms race showed, there also is no logical stopping point in such an arms race. Broadening the number and type of weapons to allow strikes against military targets creates an incentive to be able to strike as many targets as possible. Obtaining the option to strike

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at tactical military targets lowers the threshold of escalation and may lead a given side to be more willing to attack. Reducing the vulnerability of steadily larger inventories of weapons and delivery systems may lead to a loss of control, or more lethal plans to preempt or launch under attack. Larger forces potentially increase the risk that weapons directed against military targets will hit population centers. Further, a state under existential attack by one neighbor may lash out against other states -- a pattern Iraq already has exhibited by launching missile attacks against Israel during the Gulf War.

It cannot be stressed too firmly, however, that the possibility of such “worst-case” risks does not make them probable. Rational, moderate leaders do not take existential risks or escalate to genocidal conflicts. At the same time, it is difficult to say that proliferation leads to predictable crisis behavior or escalation ladders. Further, they create problems in terms of establishing any clear limits as to how the potential use of given types of weapons of mass destruction -- like chemical weapons -- relate to the use of biological weapons and nuclear weapons. These uncertainties mean that the US must at least consider worst-case contingencies.

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Table IX-3

The Comparative Effects of Biological, Chemical, and Nuclear Weapons Delivered Against a Typical Urban Target in the Middle East

Using missile warheads: Assumes one Scud sized warhead with a maximum payload of 1,000 kilograms. The study assumes that the biological agent would not make maximum use of this payload capability because the country deploying such systems cannot make an efficient warhead. It is unclear this assumption is realistic.

	Area Covered in Square Kilometers Per Square Kilometer	Deaths Assuming 3,000-10,000 people
Chemical: 300 kilograms of Sarin nerve gas with a density of 70 milligrams per cubic meter	0.22	60-200
Biological 30 kilograms of Anthrax spores with a density of 0.1 milligram per cubic meter	10	30,000-100,000
Nuclear:		
One 12.5 kiloton nuclear device achieving 5 pounds per cubic inch of over-pressure	7.8	23,000-80,000
One 1 megaton hydrogen bomb	190	570,000-1,900,000

Using one aircraft delivering 1,000 kilograms of Sarin nerve gas or 100 kilograms of anthrax spores: Assumes the aircraft flies in a straight line over the target at optimal altitude, and dispenses the agent as an aerosol. The study assumes that the biological agent would not make maximum use of the weapons weight carrying capability. It is unclear this assumption is realistic.

	Area Covered in Square Kilometers	Deaths Assuming 3,000-10,000 people Per Square Kilometer
Clear sunny day, light breeze		
Sarin Nerve Gas	0.74	300-700
Anthrax Spores	46.00	130,000-460,000
Overcast day or night, moderate wind		
Sarin Nerve Gas	0.8	400-800
Anthrax Spores	140.00	420,000-1,400,000
Clear calm night		
Sarin Nerve Gas	7.8	3,000-8,000
Anthrax Spores	300.00	1,000,000-3,000,000

Source: Adapted by the author from Office of Technology Assessment, Proliferation of Weapons of Mass Destruction: Assessing the Risks, US Congress OTA-ISC-559, Washington, August, 1993, pp. 53-54.

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The US has begun to develop a more effective counterproliferation program, but this effort has been slow, has often had a somewhat theoretical character, and has sometimes substituted rhetoric, research, and development, for reality. The US did form a new Counterproliferation Support Program in the mid-1990s. This program was intended to bring a new degree of coordination to some $3 billion worth of on-going programs that affect some aspect of counterproliferation, including theater ballistic missile defense, and the Department of Defense requested $108 million in new funding for the office in FY1996.[491]

The US has also began to develop a more precise set of goals for counterproliferation that can be applied to specific military capabilities in the Gulf. Secretary Perry listed eight possible US responses in dealing with the problem of proliferation in his FY1996 annual report, and these remain relevant today: [492]

- Dissuasion to convince non-weapons of mass destruction states that their security interests are best served through not acquiring weapons of mass destruction.
- Denial to curtail access to technology and materials for weapons of mass destruction through export controls and other tools,
- Arms control efforts to reinforce the Nuclear Non-Proliferation Treaty, Biological and Chemical Weapons Conventions, nuclear free zones, conventional arms treaties that stabilize arms races, confidence and security building measures, and Anti-Ballistic Missile Treaty clarification efforts to allow US deployment of advanced theater ballistic missile defenses.
- International pressure to punish violators with trade sanctions, to publicize and expose companies and countries that assist proliferators, and to share intelligence to heighten awareness of the proliferation problem.
- Defusing potentially dangerous situations by undertaking actions to reduce the threat from weapons of mass destruction already in the hands of selected countries -- such as agreements to destroy, inspect, convert, monitor, or even reverse their capabilities.
- Military capabilities to be prepared to seize, disable, or destroy weapons of mass destruction in time of conflict.
- Defensive capabilities, both active (theater missile defenses) and passive (protective gear and vaccines) that will mitigate or neutralize the effects of weapons of mass destruction and enable US forces to fight effectively even on a contaminated battlefield.

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The US made counterproliferation a military mission as part of its Unified Command Plan on May 24, 1995, and has progressively improved its plans to deal with such threats.[493] Department of Defense plans for FY2001 describe the situation as follows:[494]

> …the threat or use of chemical and biological weapons, is a likely condition of future warfare, especially in the early stages of war for purposes of disrupting U.S. operations and logistics. These weapons may be delivered by ballistic missiles, cruise missiles, aircraft, special operations forces, or other means. This requires that U.S. forces continue to improve their capabilities to locate and destroy such weapons, preferably before such weapons can be used, and to defend against and manage the consequences if these weapons are used. Capability enhancements alone are not enough. Equally important is continuing to adapt U.S. doctrine, operational concepts, training, and exercises to take full account of the threat posed by chemical and biological weapons and other likely asymmetric threats. Moreover, given that the United States will most likely conduct future operations in coalition with other countries, the United States must also continue to encourage its friends and allies to train and equip their forces for effective operations in chemical and biological weapons environments.
>
> …The Department has progressed substantially toward fully integrating considerations of nuclear, biological, and/or chemical weapons use against U.S. forces into its military planning, acquisition, intelligence, and international cooperation activities. These include efforts to:
>
> • Embed counterproliferation considerations in all aspects of the planning and programming process.
>
> • Adapt military doctrine and operational plans to deal with NBC weapons in regional contingencies.
>
> • Adjust acquisition programs to ensure that U.S. forces will be adequately trained and equipped to operate effectively in contingencies involving NBC threats.
>
> • Reallocate intelligence resources to provide better information about adversary NBC capabilities and how they are likely to be used
>
> • Undertake multilateral and bilateral cooperative efforts with U.S. allies and friends to develop a common defense response to the military risks posed by NBC proliferation.
>
> The Quadrennial Defense Review underscored the need for these efforts; accordingly, the Secretary of Defense in 1997 increased planned spending on counterproliferation by $1 billion over the Future Years Defense Program.
>
> DoD must meet two key challenges as part of its strategy to ensure future NBC attack preparedness. It must institutionalize counterproliferation as an organizing principle in every facet of military activity, from logistics to maneuver and strike warfare. It must also internationalize those same efforts to ensure U.S. allies and potential coalition partners train, equip, and prepare their forces to operate with U.S. forces under NBC conditions.
>
> To advance the institutionalization of counterproliferation, the Joint Staff and CINCs will develop a joint counter–NBC weapons operational concept that integrates both offensive and defensive measures. This strategy will serve as the basis for refining existing doctrine so that it more fully integrates all aspects of counter–NBC operations. In addition, the Services and CINCs will place greater emphasis on regular

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individual, unit, joint, and combined training and exercises that incorporate realistic NBC threats. The Services will work to develop new training standards for specialized units, such as logistics and medical units, and larger formations to improve their ability to perform complex tasks under prolonged NBC conditions. Finally, many counterproliferation–related capabilities must be available prior to or very early in a conflict. The Services will develop capability packages that provide for prepositioning or early deployment of NBC and theater missile defense capabilities and personnel into theaters of operations. The timing necessary for the arrival of such capabilities will in part determine whether or not those capabilities reside in active or reserve components.

Unless properly prepared to deal with NBC threats or attacks, allies and friends may present vulnerabilities for a U.S.–led coalition. In particular, potential coalition partners cannot depend on U.S. forces to provide passive and active defense capabilities to counter NBC threats. U.S. counterproliferation cooperation with its NATO allies through the Senior Defense Group on Proliferation provides a template for improving the preparedness of long–standing allies and other countries that may choose to act in concert with the United States in future military coalitions. Similar efforts with allies in Southwest Asia and Asia–Pacific will continue to ensure that potential coalition partners for major theater wars have effective plans for NBC defense of populations and forces.

Force Improvements Affecting Counterproliferation Capability

The problem is that the US has not got following up by creating a comprehensive program for acting on these options. In fact, the US has had considerable difficulty in defining the exact programs that it should fund. The Department of Defense does have a major research and development effort to improve related intelligence, battlefield surveillance, passive defense, active defense, and counter-force capabilities, as well as related counter-terrorism, export control and arms control inspection activities.

US work on counterproliferation has also identified 16 priority technologies and 14 war fighting capabilities where the US must make improvements in its counterproliferation capabilities. These warfighting capabilities were selected as part of the Joint Staff's Warfighting Capabilities Assessment (JWCA) process. They can be grouped into seven areas where US capabilities in the Gulf all need major improvement:[495]

- *Detection and characterization of biological and chemical agents*. This initiative is intended to accelerate the fielding of stand-off and point-detection and characterization systems by up to six years. It also addresses the integration of sensors into existing and planned carrier platforms, emphasizing man-portability and compatibility with UAVs.

- *Detection, characterization, and defeat of hard, underground targets*. The US is seeking new sensors, enhanced lethality, and penetrating weapons to increase the probability of defeating the target while minimizing the risk of collateral damage.

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- *Detection, localization and neutralization of weapons of mass destruction inside and outside the US*. The US is seeking to identify and evaluate systems, force structures, and operational plans to protect key military facilities and logistic nodes, and conduct joint exercises to improve the capability to respond to potential biological and chemical threats.

- *Development and deployment of additional passive defense capabilities for US forces, including development and production of biological agent vaccines*. This program will develop and field improved protective suits, shelters, filter systems, and equipment two to five years faster than previously planned. It also restores funding to the development of improved decontamination methods.

- *Support for weapons of mass destruction-related armed control measures include strengthening the NNPT, CTB, and BWC*. They include establishing a COCOM successor regime, and improving controls on exports and technology by strengthening the MTCR, Nuclear Suppliers Group and Australia Group.

- *Missile defense capabilities, with primary emphasis on theater ballistic missile defenses.* This activity involves improvements in active and passive defenses, attack operations, and improvements in BM/C^4I as well as the deployment of theater missile defenses. The primary focus, however, is on anti-ballistic missile defenses, and in the near-term, this involves the development of the Patriot Advanced Capability Level-3 (PAC-3/ERINT), Navy area theater missile defense (Aegis), and theater high altitude area defense (THAAD).

Such goals, priorities, and research and development activities are all very well, but warfighters cannot use RDT&E activity in the field. They need actual deployments to have warfighting capability. The US gave early deployment priority to programs to detect and characterize biological and chemical weapons beginning in FY1995 -- including programs using new UAVs and protected vehicles. From FY1996 on, it began to deploy new emitter identifiers to identify and track ships carrying NBC-related cargoes. It accelerated the long-range biological stand-off detector system, and joint lightweight protective suit program. It improved its targeting systems to attack NBC facilities and minimize collateral damage. It improved intelligence support for counterproliferation efforts, strengthened cooperative programs with allied forces, and continued to invest heavily in new theater missile defense programs.

The US, however, has deferred many new program initiatives, partly because of the need to allocate resources to conventional programs and partly because of the need to eliminate duplicative and low-priority research efforts and to focus on specific options to correct the gaps in existing US capabilities.[496]

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Counterstrike and Missile Defense Capabilities

US military planners have long emphasized the need for the early arrival of an integrated missile defense, and the Congress has placed a new emphasis on theater missile defense (TMD) in its mark-up of the FY1996 defense budget. Theater missile defense is seen as performing three critical roles: reinforcing the deterrence of the use of weapons of mass destruction, providing active counterproliferation defenses in combat, and protecting the infrastructure, ports, prepositioned equipment, and allied forces necessary to support forces deploying from CONUS and outside the theater.[497]

The US has already offered its Southern Gulf allies early warning data on missile launches against them, and has made at least the tacit recommendation that that the Southern Gulf states develop an integrated theater ballistic missile defense system to supplement or replace their present IHawk and Patriot surface-to-air missiles.

The Department of Defense summarizes its present plans to develop and deploy theater ballistic missile defenses as follows:

- … the Department's immediate missile defense priority is to develop, procure, and deploy TAMD systems to protect key facilities and forward–deployed elements of the U.S. armed forces, as well as allies and friends. This plan envisions time–phased acquisition of a multi–tier, interoperable ballistic missile defense system that provides defense in depth against theater ballistic and cruise missiles.…The increased emphasis on interoperable air and missile defenses has led to a family of systems concept. A key aspect of the family of systems approach is to leverage the synergy among air, ballistic, and cruise missile defenses, and to integrate various systems in a comprehensive effort to defeat the threat. This concept calls for a flexible combination of integrated, interoperable TAMD systems capable of coalition joint theater operations. It includes several individual weapon systems, various sensors, and advanced battle management/command, control, communications, computers, and intelligence capabilities.

- Lower–tier systems remain the top priority to defeat short–range ballistic missiles. The Patriot Advanced Capability–3 (PAC–3) and the Navy Area Defense systems are the key lower–tier systems for the TAMD mission. PAC–3 will provide air defense of ground combat forces and defense of high–value assets against high–performance, air–breathing, and theater ballistic missiles. The FY 2001 budget begins to procure PAC–3 missiles, with first unit equipped (FUE) projected for FY 2001. Consistent with congressional direction, the program has completed two successful intercepts and is awaiting a final decision before proceeding to low–rate initial production.

- The Navy Area Defense program, using a reconfigured SPY–1 phased–array radar and an upgraded version of the Standard Missile (Block IVA) on Aegis–equipped ships, will provide U.S. forces, allied

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forces, and areas of vital national interest at sea and in coastal regions with an active defense against theater ballistic and cruise missiles. Low–rate initial production of the Block IVA missiles will begin in FY 2001 in support of developmental and operational testing prior to planned FUE in FY 2003. As of the second quarter of FY 1999, an interim Navy Area Theater Ballistic Missile Defense software capability, Linebacker, was deployed and put into operation on two ships.

- The Department has worked with its international partners, Germany and Italy, to restructure the Medium Extended Air Defense System (MEADS), to include a three–year Risk Reduction Effort (RRE). The RRE will allow the Department to take advantage of less costly program options that build on capabilities from existing TMD weapons systems, such as the PAC–3. The NATO MEADS Management Agency awarded a contract to MEADS International (comprised of Lockheed Martin, Damiler Chrysler Aerospace AG, and Alenia Marconi Systems) in November 1999 to begin work on the next phase of the program. The RRE effort will focus on reducing the risk and cost of the critical elements of the systems (i.e., fire control radar and mobile launcher) needed to fulfill the requirements for a highly mobile, rapidly deployable TMD system capable of providing 360–degree coverage for maneuver forces. The Department fully funded the MEADS program by adding $721 million from FY 2002 to FY 2005.

- Upper–tier systems—the Theater High Altitude Area Defense (THAAD) system and the Navy Theater Wide program—are designed to intercept incoming missiles at high altitudes in order to defend larger areas, defeat medium– and intermediate–range ballistic missiles, and increase theater commanders' effectiveness against weapons of mass destruction (WMD). THAAD will make possible more effective protection of broad areas, dispersed assets, and population centers against TBM attacks. With two recent successful intercept tests, the Department determined that the THAAD program had met the exit criteria necessary for entering the engineering and manufacturing development phase of acquisition. Based on this decision, an FUE of FY 2007 is anticipated for THAAD.

- The Navy Theater Wide system builds upon the existing Aegis Combat System as well as the Navy Area Defense system and is funded to continue Aegis Leap Intercept (ALI) flight testing through FY 2002. The Leap testing program will determine whether a modified standard missile, operating in conjunction with the Aegis weapon system, can intercept a ballistic missile in the exoatmosphere. The ALI flight test results will provide the data necessary to determine whether the program performance supports accelerated development and deployment of the system, which would require additional funds in FY 2003 and the subsequent fiscal years. Currently the budget provides for continued development through the Future Years Defense Program at approximately $200 million per year.

- As an additional layer of missile defense, the Airborne Laser (ABL) will engage ballistic missiles during their boost phase of flight. By terminating powered flight early, ABL causes a missile's warhead to fall short of its intended target. ABL development is paced to accomplish a lethality demonstration against an in–flight ballistic missile in FY 2005.

- Cruise missile defenses (CMD) are either evolving from existing systems or are being developed from scratch. The Cooperative Engagement Capability is being used to net together air defense radar systems while investigations of selected ballistic missile defense weapons' elements, such as missile defense sensors; elevated network sensors; battle management/command, control, and communications; and weapons, are underway to adapt and apply them to CMD. The investigations include elements from PAC–3 and Navy Area lower–tier systems. The CMD development strategy is to identify and leverage the synergy possibilities among ballistic missile, cruise missile, and air defense, and to employ them to build–up CMD via an integration of weapons systems into a comprehensive network that can defeat the cruise missile threat. In addition, CMD–focused advanced technology programs are investigating ways to add depth to existing capability, such as shooting down land attack cruise missiles at extended ranges, possibly

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even over an adversary's territory. One such program is the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS), which will provide a long–endurance, extended range detection and tracking capability required to defeat the land attack cruise missile threat. To position the Department to capitalize on all CMD developments, a collaborative process is underway to devise concepts for joint employment and a TAMD investment plan, including CMD. The combatant commanders in chief, the Services, the Ballistic Missile Defense Organization, and the Joint Theater Air and Missile Defense Organization are participating in this collaborative process.

- …As part of broader efforts to enhance the security of U.S., allied, and coalition forces against ballistic missile strikes and to complement U.S. counterproliferation strategy, the United States is exploring opportunities for theater ballistic missile defense cooperation with its allies and friends. The objectives of U.S. cooperative efforts are:

- To provide effective missile defense for U.S., allied, and friendly troops, and for allied and friendly civilian populations.

    - To strengthen U.S. security relationships.

    - To enhance collective deterrence of missile attacks.

    - To share the burden of developing and fielding theater missile defenses.

    - To enhance interoperability between U.S. forces and those of allies and friends.

- …The United States is taking an evolutionary and tailored approach to allied cooperation that accommodates varying national programs and plans, as well as special national capabilities. This approach includes bilateral and multilateral research and development, off–the–shelf purchases, and coproduction of TMD components or entire systems. Furthermore, as part of an ongoing initiative aimed at countering the TBM threat, the United States is sharing early warning data on launches of theater–range ballistic missiles with allies and friends as a means of engendering greater cooperation on theater missile defense.

- …U.S.–Israeli cooperative programs, including shared early warning on theater missile launches and the development of the Arrow weapon system, assist Israel in developing a ballistic missile defense capability to deter and, if necessary, defend against current and emerging ballistic missile threats in the region. Planned interoperability with U.S. theater missile defense systems will afford Israel a more robust defense. Moreover, the program provides technical benefits for both sides by expanding the theater missile defense technology base and providing risk mitigation for U.S. weapon systems.

These theater missile defense programs offer significant potential benefits, but most are in far more trouble than the Department's plans indicate, and are experiencing major development, cost, and effectiveness problems. They now only seem likely to be deployable after 2010, and they serious questions about their area defense capability, because the US is currently placing on the wide-area defense coverage to eliminate any risk it may violate the ABM Treaty. This may be the equivalent of "overkill" in terms of arms limitations and "underkill" in terms of effective missile

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defense. It could sharply degrade the effectiveness of US missile defense efforts, and may make area-defense of a region like the Gulf unaffordable.

Extended Deterrence with US Strategic Forces and Nuclear Weapons

There is one other important option for counterproliferation. The US can deal with the problem of Iranian and Iraqi proliferation through the threat of conventional or nuclear retaliation as well as by efforts at prevention and defense. The US demonstrated its potential capabilities for conventional retaliation during its strategic strikes against Iraq during the Gulf War, but it has never publicly stated that it has a doctrine of conventional strategic retaliation to deal with Iranian or Iraqi use of weapons of mass destruction.

US policy has been ambiguous about providing nuclear guarantees, but it has not rejected them. The US Nuclear Posture Review of 1993 concluded that,[498]

> "the US does not have a purely national deterrent posture, it extended the deterrent posture of its nuclear arsenal to its allies. A very progressive aspect of US nuclear posture is that it is, in part, an international posture. The NPR strongly supports continued commitment to NATO and Pacific allies."

The omission of any specific mention of extending the US nuclear umbrella to cover the Gulf and Middle East does not mean that the US should or would not provide such coverage. In 1990, President Bush and Secretary Baker at least implied that the US might use such weapons in response to an Iraqi use of weapons of mass destruction during the Gulf War. On April 26, 1996, Secretary Perry hinted that the US might use nuclear weapons to deal with the chemical threat from Libya, although his press spokesman later stressed conventional options.[499] Further, the Joint Staff directed in their Joint Strategic Capabilities Plan beginning in 1992 that US forces should target weapons of mass destruction in "threat" states and USCENTCOM is known to have assisted the US Strategic Command in identifying suitable threat states and targets. This has led to reports that targets in states like Iran and Iraq are included in the Single Integrated Operational Plan (SIOP) used for nuclear targeting.[500]

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US officials may well feel that any public statement that the US might use nuclear weapons in regional contingencies would do more to provoke hostile states into proliferating than to deter their use of weapons of mass destruction, and that any such US threats should be carefully targeted to deal with specific contingencies. Nevertheless, it is far from clear that the US now has a well-defined doctrine for extended deterrence, for using conventional or nuclear weapons against the threats posed by weapons of mass destruction, and for signaling to potential threat states the conditions under which the US might retaliate or preempt. The Department of Defense has consistently failed to deal with this issue in its policy statements since 1993. Its FY1997-FY2002 budget requests, and recent reports on proliferation, have rarely discussed the counterforce aspects of counterproliferation and have then focused heavily on conventional weapons.[501]

This inattention dramatizes the potential need to develop a retaliatory doctrine tailored to the defense of the Gulf. It also raises questions about the long-term regional implications of cuts in US nuclear capabilities. The US has already reduced its active nuclear stockpile more than 60% since the Cold War and will reduce it by well over 80% by 2005. The US has also eliminated about 75% of all of its nuclear weapons storage facilities, including most forward-deployed storage sites outside the US. It has removed all tactical nuclear weapons from its ground force, taken nuclear weapons off of its carriers, removed most nuclear weapons from its tactical aircraft, and removed nuclear-armed cruise missiles from its surface ships.[502]

These are all important steps towards reducing the nuclear arms race, but there are limits as to how far the US should go until the Gulf becomes a weapons of mass destruction-free zone. If Iran or Iraq should acquire nuclear weapons, the US will almost certainly be forced to extend its nuclear umbrella to the Gulf, either through its bombers or systems like its submarine-launched cruise missiles.

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The Problem of Proxies, Unconventional Means and Terrorism

Finally, much of the current discussion of counterproliferation, defenses, and extended deterrence assumes that the enemy will be a state that has declared war and/or uses an orthodox military delivery system. It is far from clear that this is the case. Iran, Iraq, or some other threat might chose to deliver weapons of mass destruction using covert means, some proxy or terrorist organization, or a commercial transport rather than a weapons system. It is impossible to explore all of the options involved in an overview of US power projection capabilities in the Gulf, but some have been discussed in previous chapters and Table IX-4 provides a brief outline of the possibilities. These factors cannot be ignored in any realistic assessment of the risk posed by nuclear, chemical, and biological weapons, and the US must tailor its counter proliferation capabilities in the Gulf as much around acts of asymmetric warfare as missile defense, conventional retaliations, and extended deterrence.

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Table IX-4

The Problem of Terrorism and Unconventional Warfare

- Existing and projected detection and control technologies, arms control proposals, and concepts for missile defense assume that the primary threats are organized states and that relatively large efforts must be used.
- Conventional structures of deterrence assume identifiable and limited sets of opponents and similar values in dealing with issues like mutual destruction. Terrorist movements may be willing to take catastrophic risks, as may leaders who identify themselves with state and/or see martyrdom as a valid alternative to victory.
- War may not be between states or fought for limited strategic objectives. It may be a war of proxies or terrorists. It may be fought to destroy peoples or with minimal regard for collateral damage and risks.
- The target of unconventional uses of weapons of mass destruction may not be military in the normal sense of the term. It may be a peace process, US commitment to the defense of a given region, a peace keeping force, an election or ruling elite, or growing cooperation between formerly hostile groups.
- Terrorist organizations have already attempted to use crude chemical weapons. The development and use of chemical and biological weapons is well within the capability of many extremist and terrorist movements, and states can transfer weapons or aid such movements indirectly or with plausible deniability.
- Covert or unconventional delivery means may be preferable to both states and non-state organizations. Cargo ships, passenger aircraft, commercial vehicles, dhows, or commercial cargo shipments can all be used, and routed through multiple destinations. A well established series of covert transport and smuggling networks exist throughout the region. Biological weapons can be manufactured in situ.
- The Marine Corps Barracks incident has already shown the potential value of “mass terrorism,” as had the media impact of the Oklahoma City bombing and disruptive effect of far more limited events like the suicide bombings by Hamas and the assassination of Yitzak Rabin.
- Biological weapons and chemical present special problems because they can be used in so many ways. Chemical poisons were once used to contaminate the Israeli fruit group. Infectious biological agents could be used to mirror image local diseases or with long gestation times. Persistent nerve agents could be used in subways, large buildings, shopping malls/bazaars, etc. to create both immediate casualties and long term risks. Mixes of biological and chemical agents could be used to defeat detection, protection gear or vaccines.
- Arms control efforts assume large state efforts with detectable manufacturing and weaponization programs in peacetime. The development of a capability to suddenly manufacture several hundred biological and chemical weapons with little or no warning is well within the state of the art using nothing but commercial supplies and equipment, and much of the R&D effort could be conducted as civil or defensive research.
- Unconventional and terrorist uses of weapons can involve the use of extremely high risk biological weapons transmitted by human carriers, commercial cargoes, etc.
- The incentives for the unconventional use of weapons of mass destruction increase in proportion to the lack of parity in conventional weapons, the feelings of hopelessness by alienated or extremist groups, or the prospect of catastrophic defeat.
- Similarly, the incentive for the unconventional use of weapons of mass destruction will increase in direct proportion to the perceived effectiveness of theater missile and other regular military defense systems.
- Rogue operations will be a constant temptation for state intelligence groups, militant wings of extremist groups, revolutionary forces. etc.

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Such attacks are technically feasible and could offer Iran and Iraq significant advantages in a wide range of scenarios. These contingencies are the most threatening form of asymmetric warfare the US could face in the Gulf, and the range of contingencies could include the following types of cases:

- A radiological powder is introduced into the air conditioning systems of Saudi high-rise buildings or tourist hotels. Symptoms are only detected over days or weeks and public warning is given several weeks later. The authorities detect the presence of such a power, but cannot estimate its long-term lethality and have no precedents for decontamination. Tourism collapses, and the hotels eventually have to be torn down and rebuilt.

- An Iraqi/Iranian-backed terrorist group smuggles parts for a crude gun-type nuclear device into Israel or bought in the market place. The device is built in a medium sized commercial truck. A physics student reading the US Department of Defense weapons effects manual maps Tel Aviv to maximize fall out effects in an area filled with buildings with heavy metals and waits for a wind maximizing the fall out impact. The bomb explodes with a yield of only 8 kilotons, but with an extremely high level of radiation. Immediate casualties are limited but the long-term death rate mounts steadily with time. Peace becomes impossible and security measures become Draconian. Immigration halts and emigration reaches crisis proportions. Israel as such ceases to exist.

- Several workers move drums labeled as cleaning agents into a large shopping mall, large public facility, subway, train station, or airport. They dress as cleaners and are wearing what appear to be commercial dust filters or have taken the antidote for the agent they will use. They mix the feedstocks for a persistent chemical agent at the site during a peak traffic period. Large scale casualties result, and Draconian security measures become necessary on a national level. A series of small attacks using similar "binary" agents virtually paralyze the economy, and detection is impossible except to identify all canisters of liquid.

- Immunized terrorists visit a US carrier or major Marine assault ship during the first hours of visitor's day during a port call in the Middle East. They are carrying Anthrax powder in bags designed to make them appear slightly overweight. They slowly scatter the powder as they walk through the ship visit. The immediate result is 50% casualties among the ship's crew, its Marine complement, and the visitors that follow. The US finds it has no experience with decontaminating a large ship where Anthrax has entered the air system and is scattered throughout closed areas. After long debates over methods and safety levels, the ship is abandoned.

- An Iraqi/Iranian-backed terrorist group seeking to "cleanse" a nation of its secular regime and corruption introduces a modified type culture of Ebola or a similar virus into an urban area. It scatters infectious cultures in urban areas for which there is no effective treatment. By the time the attack is detected, it has reached epidemic proportions. Medical authorities rush into the infected area without proper protection, causing the collapse of medical facilities and emergency response capabilities. Other nations and regions have no alternative other than to isolate the nation or center under attack, letting the disease take its course.

- An Iraqi/Iranian-backed backed terrorist group modifies the valves on a Japanese remote-controlled crop spraying helicopter which has been imported legally for agricultural purposes. It uses this system at night or near dawn to spray a chemical or biological agent at altitudes below radar coverage in a line-source configuration. Alternatively, it uses a large home-built RPV with simple GPS guidance. The device eventually crashes undetected into the sea or in the desert. Delivery of a chemical agent achieves far higher casualties than any conventional military warhead. A biological agent is equally effective and the first symptoms appear days after the actual attack -- by which time treatment is difficult or impossible.

- A truck filled with what appears to be light gravel is driven through the streets of Riyadh, Kuwait City, Tehran, or Tel Aviv during rush hour or another maximum traffic period. A visible powder does come out through the tarpaulin covering the truck, but the spread of the power is so light that no attention is paid to it. The driver and his assistant

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are immunized against the modified form of Anthrax carried in the truck that is being released from behind the gravel or sand in the truck. The truck slowly quarters key areas of the city. Unsuspected passersby and commuters not only are infected, but carry dry spores home and into other areas. By the time the first major symptoms of the attack occur some 3-5 days later, Anthrax pneumonia is epidemic and some septicemic Anthrax has appeared. Some 40-65% of the exposed population dies and medical facilities collapse causing serious, lingering secondary effects.

- Iraq equips a freighter or dhow to spread Anthrax along a coastal area in the Gulf. It uses a proxy terrorist group, and launches an attack on Kuwait City and Saudi oil facilities and ports. It is several days before the attack is detected, and the attacking group is never fully identified. The form of Anthrax involved is dry and time encapsulated to lead to both massive prompt casualties and force time consuming decontamination. Iraq not only is revenged, but benefits from the resulting massive surge in oil prices.

Such scenarios may seem to borrow plots from bad spy novels and science fiction, but all of the scenarios are at least technically possible. These scenarios also illustrate the fact that Iraq does not need sophisticated military delivery systems or highly lethal weapons of mass destruction, but can use terrorism to pose existential threats, complex mixes of weapons of mass destruction, and mix terrorism with elements of covert action and deniability. As a result, they present a major challenge to both the "revolution in military affairs" and US counterproliferation programs.

Missile and conventional defenses can do nothing to prevent these ultimate forms of asymmetric attacks. Improved intelligence and dedicated efforts to train and equip allied internal security forces can. So can a clear US commitment to retaliating against such an attack on any Southern Gulf ally, including the possible use of nuclear weapons in retaliation against a truly devastating attack.

Effective counterproliferation capability requires a dedicated US effort to detect and defend against asymmetric attacks on it gulf allies as well as the creation of the kind of well defined offensive options that can attack as a powerful deterrent and serve as a means of retaliation that will prevent Iran or Iraq from exploiting an attack and deter any repetition.

The US should also recognize that such attacks may be directed at its Arab allies outside the Gulf such as Egypt and other regional allies like Israel and Turkey. It is possible that Britain or some other European coalition ally could be a target. US forces in the theater are certainly as much a possible target as any ally, and so are major US facilities ranging from embassies and businesses. Such attacks would also be the most effective way Iran and Iraq could attack the

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American homeland and do so with the most hope of anonymity and least risk of attribution. The asymmetric use of weapons of mass destruction is another key aspect of the "globalization" of proliferation.

Implications for US Policy

In the near-term, the US can probably deal with proliferation by Iran and Iraq by a combination of missile and air defense, using the Patriot and other US and regional air defenses, retaliatory threats or strikes, using conventional air and missile power, and passive defense measures like chemical protection gear. It is doubtful, however, that such measures will be adequate much beyond the early 2000s, and it is increasingly doubtful that arms control measures and efforts to limit technology transfer to Iran and Iraq offer the US and the Southern Gulf states even mid-term security against Iran and Iraq.

The US will need a far more capable program in the future, and this should involve the following US policies:

- *The development of a comprehensive counterproliferation future year budget program focused on deployed warfighting capabilities and not research and development, and with clear milestones for improving these capabilities over time.* There should be a detailed and fully funded five year plan for improving deployed US intelligence, battlefield surveillance, passive defense, active defense, and counter-force capabilities, as well as related counter-terrorism, export control and arms control inspection activities. This should be supported by a 10 or 20 year RDT&E plan oriented at near and mid-term deployment and with clearly described plans to deploy the technologies under study.

- *The US needs to improve its capability to use strike aircraft and cruise missiles against the facilities and actual weapons systems linked to weapons of mass destruction.* These programs will reinforce ongoing efforts that include the

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development and deployment of improved sensors, ELINT capabilities, and intelligence collection assets, along with the ability to conduct 24 hour operations and respond to new targeting data at a near real-time pace.

- *The US needs to develop and deploy an integrated air and missile defense capability in the Gulf.* The US needs a clear plan to choose between RDT&E options and to actually deploy theater ballistic missile defenses. Such defenses must be clearly tied to equally effective defenses against aircraft and cruise missiles, and covert or terrorist attacks using chemical, biological, radiological, and nuclear weapons.

- The US should coordinate with its Southern Gulf allies, and develop a clear plan for providing extended deterrence, including the possible US use of nuclear weapons against any Gulf power that uses weapons of mass destruction against US or allied forces and the territory of any ally. The US should make it clear that it will target weapons of mass destruction, military, and leadership targets in Iraq and Iraq, and that nuclear targeting will be an option. Ambiguity and uncertainty have their place; the Gulf is not one of them. The clear and certain threat of force will be clearly understood, and minimize the political complications if the US has to use it. It should be clear to both Iran and Iraq, and the world, that the US will regard any attack on Southern population centers using any weapon of mass destruction as justification for using massive conventional strikes, and possibly nuclear weapons, against the attacker's population centers.

- *The US should extend this doctrine to any covert, asymmetric, or proxy use of weapons of mass destruction against an ally.* As has been mentioned earlier, effective counterproliferation capability requires a dedicated US effort to detect and defend against asymmetric attacks on it gulf allies as well as the creation of the kind of well defined offensive options that can attack as a powerful deterrent and serve as a means of retaliation that will prevent Iran or Iraq from exploiting an attack and deter any

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repetition. The US should also recognize that such attacks may be directed at its Arab allies outside the Gulf such as Egypt and other regional allies like Israel and Turkey. It is possible that Britain or some other European coalition ally could be a target. US forces in the theater are certainly as much a possible target as any ally, and so are major US facilities ranging from embassies and businesses.

- *One key aspect of the effort will be to reexamine US physical protection methods.* Although the US pays in excess of $4 billion a year for the improved physical security of US military diplomatic, and federal facilities, this effort is largely designed only to reduce vulnerability to small attacks and the use of high explosives. Little effort is put into improving detection and defense against CBRN attacks or terrorism.

These policy recommendations may initially sound "hawkish" or "draconian." They are not. The real dangers lie in the kind of ambiguity as to the US response that existed at the time of the start of the "tanker war" against Iran, and the Gulf War against Kuwait. Deterrence can only work in the Gulf if there are no doubts about what will happen if weapons of mass destruction are used, and if all concerned understand that the attacking nation may well be attacked in kind. The goal is to prevent any use of such weapons, not to bind the US to policies that may be well-intended, but which ultimately could create enough doubt about American resolve to encourage an attack on an ally.

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X. US Security Policy on the Periphery of the Gulf

The Gulf is so complex a region that it is impossible to discuss all of the policy and issues on its periphery. These include problems like the security of the Red Sea and Indian Ocean, and the risk that the Indian-Pakistani conflict could spill over into the region, and the growing problem that Afghani/Pakistani terrorism and support of violent extremists poses for the region. There are two issues on the periphery, however, that are so important to US policymaking that they cannot be ignored.

The Arab-Israeli Conflict

The Arab-Israeli conflict not only affects the hearts and minds of the entire region, it creates a linkage between the Arab-Israeli confrontation states, Israel's nuclear and missile forces, and proliferation in Iran and Iraq. It undermines the ties between the moderate Southern Gulf states and the West, and it tends to fracture three of the world's great religions. It strengthens the hands of Iran extremists, and Saddam Hussein's ability to play the "pro-Arab" card against the US.

In spite of past progress in the Arab-Israeli peace process, it is now all too clear that relations between Israeli and Palestinians can take the form of a prolonged conflict. Israel is still formally at war with Syria and Lebanon, and faces a serious rejectionist threat from terrorists, Iran, and Iraq. Following the Israeli withdrawal from South Lebanon, Israel still faces a security threat from Hezbollah– a Shi'ite Islamic movement with strong Iranian and Syrian sponsorship. Lebanon remains under Syrian and Israeli occupation, and its factions still present the threat of another round of civil war. *A strong, highly visible and continuing US effort to find a solution, and an Arab-Israeli peace that all parties can agree to, is more than an Arab-Israeli issue. It is critical in the Gulf to find security and to reducing the threat of terrorism.*

At the same time, its Gulf allies need to be very realistic about US ties to Israel. US military aid to Israel, and Israel's confidence in US support in an emergency, is the only way

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that Israel can ever be secure enough to reach the kind of peace with will be acceptable to the Palestinians, Syria, and Lebanon. A strong Israel is the only Israel that will never use nuclear weapons or other weapons of mass destruction, and that can move from peace to arms control. There are some in the Arab world, and even some US and European Arabists, that cannot seem to grasp this reality, They would find the reality created by an isolated Israel far worse.

Turkey and the Kurds

The US should seek to ensure the security of Iraq's Kurds and their political and human rights – possible through the kind of limited autonomy that previous Iraqi governments have promised them. The US has no strategic interest in any form of "Kurdistan," however, and creating a Kurdish nation which could create a new source of instability in the Gulf.

This does not mean the US should abandon its broader concerns for the human rights of all the Kurds in the region but it also does not mean that the US should raise Kurdish hopes of independence, and using the Kurds as a base for military adventures against Iraq. The US made this mistake in the mid-1970s. It labeled the Kurds as traitors in the eyes of many Iraqi's and the US then abandoned the Kurds in 1975 because of its strategic interest in Iran. There have been enough ethnic tragedies in recent wars. The US should not risk creating another one.

More broadly, the US has a strong strategic interest in Turkey and in ensuring that Turkey will provide aid and power projection facilities in the event of any new adventures by Iraq. A strong, friendly and largely secular Turkish interest is of great strategic value to the US in dealing with value to the US in dealing with Iran, the Caspian, and Central Asia as well.

Central Asia and the Caspian: Putting an End to the "New Great Game"

As has been discussed in Chapter V, the US has become over-engaged in the Caspian and Central Asia, largely because of mistaken policies in dealing with Iran. The Clinton Administration involved the US in this "new Great Game" to obtain access to what were perceived as massive oil

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reserves, limit Russian influence, and prevent Iran from profiting from Caspian oil. In practice, Caspian and Central Asian energy reserves seem to be the size of a new North Sea at most, and will develop slowly. There is no reason to challenge Russia in its own backyard, particularly since Chechnya has shown Russia that it has little reason to reabsorb Islamic and non-Russian minorities.

"Pipeline politics" seem unlikely to seriously affect Iran's future military efforts in any way, but they already interfere with the operations of US companies in the Caspian and Central Asia, create pointless political antagonism in Iran and Russia, and attempt to legislate energy development in Turkey. *US interests in the Caspian and Central Asia at most require the US to seek a level playing field for US companies in developing the region's energy resources. Once again, the best way for the US and the world to win this particular "new great game" in terms of globalism is not to play it.*

Afghanistan, Pakistan, Drugs, and Iran

The US and Iran have already been able to cooperate unofficially in one area. Both governments have shown that they share a common interest in blocking Afghanistan's support of terrorist movements on it soil, like that of Usama bin Ladin, and in halting the Taliban's export of neo-Wahhabi Islamic extremism and terrorism to Central Asia and the Gulf region. This is also one of the few issues that both governments have been able discuss, if unofficially.[503] *They also have shown they share a common interest in halting the flow of drugs across the Iranian border, and which the Taliban has vastly increased and made Afghanistan's largest export. The US has repeatedly sought to increase cooperation in these areas in recent years and should continue to do so.*

The US should continue to do what it can to expand this cooperation, and also the persuade Pakistan, particularly Pakistani intelligence, to turn away from its de facto support of the Taliban's extremism and Islamic extremists and terrorism. The end of the Cold War, and political change in Afghanistan, have created new strategic priorities for the US in South Asia. At

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this point Pakistan threatens to be a strategic liability rather than an asset. The most recent US State Department report on terrorism makes this point, at least indirectly,[504]

> In 1999 the locus of terrorism directed against the United States continued to shift from the Middle East to South Asia. The Taliban continued to provide safehaven for international terrorists, particularly Usama Bin Ladin and his network, in the portions of Afghanistan they controlled. Despite the serious and ongoing dialogue between the Taliban and the United States, Taliban leadership has refused to comply with a unanimously adopted UNSC resolution demanding that they turn Bin Ladin over to a country where he can be brought to justice.
>
> The United States made repeated requests to Islamabad to end support for elements harboring and training terrorists in Afghanistan and urged the Government of Pakistan to close certain Pakistani religious schools that serve as conduits for terrorism. Credible reports also continued to indicate official Pakistani support for Kashmiri militant groups, such as the Harakat ul-Mujahidin (HUM), that engaged in terrorism.
>
> …Islamist extremists from around the world—including North America; Europe; Africa; the Middle East; and Central, South, and Southeast Asia—continued to use Afghanistan as a training ground and base of operations for their worldwide terrorist activities in 1999. The Taliban, which controlled most Afghan territory, permitted the operation of training and indoctrination facilities for non-Afghans and provided logistic support to members of various terrorist organizations and *mujahidin*, including those waging *jihads* in Chechnya, Lebanon, Kosovo, Kashmir, and elsewhere.
>
> Throughout the year, the Taliban continued to host Usama Bin Ladin—indicted in November 1998 for the bombings of two US Embassies in East Africa—despite US and UN sanctions, a unanimously adopted United Security Council resolution, and other international pressure to deliver him to stand trial in the United States or a third country. The United States repeatedly made clear to the Taliban that they will be held responsible for any terrorist acts undertaken by Bin Ladin while he is in their territory.
>
> In early December, Jordanian authorities arrested members of a cell linked to Bin Ladin's al-Qaida organization—some of whom had undergone explosives and weapons training in Afghanistan—who were planning terrorist operations against Western tourists visiting holy sites in Jordan over the millennium holiday.
>
> …Pakistan is one of only three countries that maintains formal diplomatic relations with—and one of several that supported—Afghanistan's Taliban, which permitted many known terrorists to reside and operate in its territory. The United States repeatedly has asked Islamabad to end support to elements that conduct terrorist training in Afghanistan, to interdict travel of militants to and from camps in Afghanistan, to prevent militant groups from acquiring weapons, and to block financial and logistic support to camps in Afghanistan. In addition, the United States has urged Islamabad to close certain madrasses, or "religious" schools, that actually serve as conduits for terrorism.
>
> …On 12 November, shortly after the United Nations authorized sanctions against the Taliban, but before the sanctions were implemented, unidentified terrorists launched a coordinated rocket attack against the US Embassy, the American center, and possibly UN offices in Islamabad. The attacks caused no fatalities but injured a guard and damaged US facilities.
>
> …Pakistan and India, several Pakistani and Kashmiri extremist groups stridently denounced US interference and activities. Jamiat-e-Ulema Islami leaders, for example, reacted to US diplomacy in the region by harshly and publicly berating US efforts to bring wanted terrorist Usama Bin Ladin, who is based in Afghanistan, to justice for his role in the 1998 US Embassy bombings in Nairobi and Dar es

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Salaam. The imposition of US sanctions on 14 November against Afghanistan's Taliban for its continued support for Bin Ladin drew a similar response.

This is a risk the US should also consider closely in its pipeline politics. Iran is scarcely an ally or friend. But, Afghanistan already has a far worse regime that Iran, and one that does far more to promote terrorism. A Pakistan, under a military dictator who may ultimately be replaced by Islamic extremists, and whose intelligence services already have ties to the Taliban, Usama bin Laden, and Islamic extremists throughout Central Asia is little better. Pakistan may have been an ally, but times change. In any case, Afghanistan and Pakistan are terrible routes for energy exports and one where the US should make it clear it will never help any company, do anything to aid its employees, or assume any risk on their behalf.

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[23] Energy Information Agency, International Energy Outlook, 2000, Washington, DOE/EIA-0484(2000), March, 2000, p. 38.
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[25] EIA rules of thumb for energy interruptions, September, 2000; EIA, "Oil Price Impacts on the US Economy," January 20, 2000, eia.does/emeu/security/sid001.htm.
[26] EIA rules of thumb for energy interruptions, September, 2000; EIA, "Oil Price Impacts on the US Economy," January 20, 2000, eia.does/emeu/security/sid001.htm.
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[28] Energy Information Agency, International Energy Outlook, 2000, Washington, DOE/EIA-0484(2000), March, 2000, p. 171
[29] BP Amoco, "BP Amoco Statistical Review of World Energy 2000," London, BP Amoco, 2000, pp. 20-21.
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[41] World Bank, World Development Indicators, 2000, Washington, World Bank, pp. 11-13.
[42] World Bank, Global Economic Prospects, 2000, Washington, World Bank, 2000. pp. 143-145.
[43] World Bank, Global Economic Prospects, 2000, Washington, World Bank, 2000. pp. 143-145.
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[45] These figures are taken from estimates in the US State Department data base for World Military Expenditures and Arms Transfers, and from World Bank, World Development Indicators, 2000, Washington, World Bank, pp. 22-24 and 38-44.
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[50] World Bank, World Development Indicators, 2000, Washington, World Bank, 2000, p. 184.
[51] Based on the country statistics in the CIA World Factbook, 2000, internet edition.
[52] Based on Figures in the IISS, Military Balance,2000-2001 and the CIA World Factbook, 2000.

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[53] There are considerable uncertainties in this estimate. The figures shown are the author's estimate, based on various editions of the CIA, World Factbook, World Bank, World Development Indicators, IISS, Military Balance, and IMF, World Economic Outlook.
[54] World Bank, World Development Indicators, 2000, Washington, World Bank, p. 12
[55] Based on Figures in the IISS, Military Balance,2000-2001 and the CIA World Factbook, 2000.
[56] World Bank, World Development Indicators, 2000, Washington, World Bank.
[57] World Bank, World Development Indicators, 2000, Washington, World Bank, 2000, p. 182.
[58] World Bank, World Development Indicators, 2000, Washington, World Bank, 2000, p. 182
[59] World Bank, Global Development Finance, 2000, Washington, World Bank, 2000, pp. 240-246.
[60] World Bank, Global Economic Prospects, 2000, Washington, World Bank, 2000. pp. 164-165.
[61] There are many different sources of figures on these trends. The author has used the constant and current dollar trend data in the various editions of "World Military Expenditures and Arms Imports" dating back to 1972. See the Bureau of Arms Control, US State Department, for these data.
[62] World Bank, Global Economic Prospects, 2000, Washington, World Bank, 2000. P. 160.
[63] World Bank, Global Development Finance, 2000, Washington, World Bank, p. 240-247.
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[66] World Bank, Global Economic Prospects, 2000, Washington, World Bank, 2000. pp. 134-145.
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[68] Middle East Economic Digest, January 8, 1999, pp. 2-3.
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[72] Department of Energy, Energy Information Agency, OPEC Fact Sheet, www.eria.gov/emeu/cabs/opec, September 7, 2000 and other data on the EIA web page.
[73] Department of Energy, Energy Information Agency, International Energy Outlook 2000, DOE/EIA-04884(00), March 2000, pp. 229, 232-233. Figures in parenthesis show the range of possible production capacity in addition to the best estimate figure shown earlier.
[74] EIA country analysis of Saudi Arabia, accessed September 16, 2000, www.eia.doe.gov/emeu/cabs/saudi.html..
[75] The Trans-Arabian Pipeline (Tapline) is largely mothballed or inoperable (having provided only limited service to a refiner in Jordan since the 1970s), and the 1.65 million bbl/d Iraqi-Saudi Pipeline (IPSA-2) was closed indefinitely following the 1990 Iraqi invasion of Kuwait
[76] EIA country analysis of Saudi Arabia, accessed September 16, 2000, www.eia.doe.gov/emeu/cabs/saudi.html.
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80 CIA, The World Factbook 2000, Washington, online edition accessed 7/2000.
81 World Bank, World Development Indicators, 1997, Washington, World Bank, 1997, pp. 16, 68, 116, 286; CIA, World Factbook, 2000, Washington, GPO, CD ROM; ;" The World Bank, World Bank Atlas, 2000, Washington, World Bank.
82 Saudi Arabia, March 1997, p. 3.

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83 CIA, World Factbook, 2000, Washington, GPO, online edition accessed 7/2000, "Saudi Arabia;" The World Bank, World Development Indicators, 2000, Washington, World Bank, p. 40.

84 CIA, World Factbook, 2000, Washington, GPO, online edition accessed 7/2000, "Saudi Arabia;" The World Bank, World Development Indicators, 2000, Washington, World Bank, p. 40.

85 World Bank, World Development Indicators, 1997, Washington, World Bank, 1997, pp. 12, 68, 116, 286; CIA, World Factbook, 2000, Washington, GPO, CD ROM, "Saudi Arabia;" The World Bank, World Bank Atlas, 2000, Washington, World Bank.

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94 This summary is based on a visit to Saudi Arabia in early 2000, Saudi Information Office fact sheets, and the EIA country analysis of Saudi Arabia, downloaded on September 16, 2000, www.eia.doe.gov/emeu/cabs/saudi.html.

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[113] EIA country analysis of Kuwait, accessed September 16, 2000, www.eia.doe.gov/emeu/cabs/kuwait.html.
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[115] Energy Information Agency, International Energy Outlook, 2000, Washington, DOE/EIA-0484(2000), March, 2000, p. 229.
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[119] CIA, World Factbook, 2000, "Kuwait," internet edition.
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[141] EIA country analysis of the UAE, September 2000, www.eia.doe.gov/emeu/cabs/uae.html.
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[215] Reuters, October 2, 2000, 1206.
[216] CIA, World Factbook, 2000, "Iran," internet edition; EIA Country report on Iran, February 2000, www.eia.doe.gov/emeu/cabs/iran.html.
[217] Reuters, October 2, 2000, 0234.
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[220] BP Amoco, BP Amoco Statistical Review of World Energy 2000, pp. 7 and 20.
[221] EIA Country report on Iran, February 2000, www.eia.doe.gov/emeu/cabs/iran.html.
[222] Associated Press, August 20. 2000, 0737;
[223] Reuters, August 20, 2000, 0725.
[224] BP Amoco, BP Amoco Statistical Review of World Energy 2000, p. 7.
[225] Energy Information Agency, International Energy Outlook 2000, DOE/EIA-04884(00), March 2000, p. 229.
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[228] EIA Country report on Iran, February 2000, www.eia.doe.gov/emeu/cabs/iran.html.
[229] This analysis of sanctions is based largely on EIA, "World Energy Sanctions," April 29, 1999, http://www.eia.doe.gov/emeu/cabs/sanction.html, and EIA, "World Energy Areas to Watch," August 2000, http://www.eia.doe.gov/emeu/cabs/hot.html.
[230] This analysis is based largely on the EIA Country report on Iran, February 2000, www.eia.doe.gov/emeu/cabs/iran.html.
[231] EIA Country report on Iran, February 2000, www.eia.doe.gov/emeu/cabs/iran.html; EIA, "World Energy Sanctions," April 29, 1999, http://www.eia.doe.gov/emeu/cabs/sanction.html, and EIA, "World Energy Areas to Watch," August 2000, http://www.eia.doe.gov/emeu/cabs/hot.html.
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[237] EIA, "World Energy Sanctions," April 29, 1999, http://www.eia.doe.gov/emeu/cabs/sanction.html and EIA Country report on Iran, February 2000, www.eia.doe.gov/emeu/cabs/iran.html.
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[240] IISS, Military Balance, 2000-2001, "Iran" and "Iraq."
[241] Interviews and USCENTCOM, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 14-15.
[242] IISS, Military Balance, 2000-2001, "Iran".
[243] Table One, Arms Control and Disarmament Agency (ACDA), World Military Expenditures and Arms Transfers, 1996, Washington, GPO, 1997, and Bureau of Arms Control, US State Department, World Military Expenditures and Arms Transfers, 1998, Washington, GPO, 2000.
[244] Table One, ACDA, World Military Expenditures and Arms Transfers, 1993-1994, Washington, GPO, 1995; Table One, ACDA, World Military Expenditures and Arms Transfers, 1995, Washington, GPO, 1996; and Table One, Arms Control and Disarmament Agency (ACDA), World Military Expenditures and Arms Transfers, 1996, Washington, GPO, 1997.
[245] British sources quoted in Jane's Defense Weekly, February 1, 1992, p. 158. The Egyptian Gazette projected expenditures of $5 billion per year in 1992, 1993, and 1994 in its January 29, 1992, issue. The Jaffee Center estimated expenditures of $8.5 billion in 189 and $8.6 billion in 1990. Andrew Duncan of the IISS estimated expenditures of $10 billion annually in 1992, 1993, and 1994 in Defense News, January 27, 1992. The CIA estimate is taken from CIA, World Factbook, 1992, "Iran;" CIA, World Factbook, 1993, "Iran;" CIA, World Factbook, 1994, "Iran;" and CIA, World Factbook, 1995, "Iran." It is extremely difficult to relate any Iranian statistics to dollar figures because Iran uses multiple exchange rates, and often reports inaccurate statistics. See Patrick Clawson, Iran's Challenge to the West, How, When, and Why, Washington, The Washington Institute Policy Papers, Number Thirty Three, 1993. p. 58.
[246] IISS, Military Balance, various editions.
[247] Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1983-1990, Washington, Congressional Research Service, CRS-91-578F, August 2, 1991, p. 53.
[248] Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1986-1993, Washington, Congressional Research Service, CRS-94-612F, July 29, 1994, p. 57, and Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1987-1995, Washington, Congressional Research Service, CRS-95-862F, August 4, 1995, pp. 57-58, 67-69.
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1996, Washington, Congressional Research Service, CRS-97-778F, August 13, 1997. 0 = data less than $50 million or nil. All data are rounded to the nearest $100 million. Major West European includes Britain, France, Germany, and Italy.

[252] Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1992-1999, Washington, Congressional Research Service, CRS-RL30275, August 18, 2000.

[253] Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1991-1998, Washington, Congressional Research Service, CRS-9 1-578F, August 2, 1991; and Conventional Arms Transfers to the Third World, 1992-1999, Washington, Congressional Research Service, CRS-RL30275, August 18, 2000. Expenditures less than $50 million are not reported. All data are rounded to the nearest $100 million. Major West European includes Britain, France, Germany, and Italy.

[254] Table II in Bureau of Arms Control, US State Department, World Military Expenditures and Arms Transfers, 1998, Washington, GPO, 2000.

[255] Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1991-1998, Washington, Congressional Research Service, CRS-9 1-578F, August 2, 1991, Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1991-1998, Washington, Congressional Research Service, CRS-9 1-578F, August 2, 1991; and Conventional Arms Transfers to the Third World, 1992-1999, Washington, Congressional Research Service, CRS-RL30275, August 18, 2000. Expenditures less than $50 million are not reported. All data are rounded to the nearest $100 million. Major West European includes Britain, France, Germany, and Italy.

[256] Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1991-1998, Washington, Congressional Research Service, CRS-9 1-578F, August 2, 1991, p. 52; and Conventional Arms Transfers to the Third World, 1992-1999, Washington, Congressional Research Service, CRS-RL30275, August 18, 2000, p. 47.

[257] Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1991-1998, Washington, Congressional Research Service, CRS-9 1-578F, August 2, 1991, Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1991-1998, Washington, Congressional Research Service, CRS-9 1-578F, August 2, 1991; and Conventional Arms Transfers to the Third World, 1992-1999, Washington, Congressional Research Service, CRS-RL30275, August 18, 2000. Expenditures less than $50 million are not reported. All data are rounded to the nearest $100 million. Major West European includes Britain, France, Germany, and Italy.

[258] Jane's Defense Weekly, June 5, 1996, p. 15.

[259] USCENTCOM, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 14-15; IISS, Military Balance, 2000-2001.

[260] There are reports that the lighter and smaller formations in the regular army include an Airmobile Forces group created since the Iran-Iraq War, and which includes the 29th Special Forces Division, which was formed in 1993-1994, and the 55th paratroop division. There are also reports that the regular army and IRGC commando forces are loosely integrated into a corps of up to 30,000 men with integrated helicopter lift and air assault capabilities. The airborne and special forces are trained at a facility in Shiraz. These reports are not correct. Note that detailed unit identifications for Iranian forces differ sharply from source to source. It is unclear that such identifications are accurate, and now dated wartime titles and numbers are often published, sometimes confusing brigade numbers with division numbers.

[261] IISS, Military Balance, 2000-2001, "Iran"; Jane's Sentinel: The Gulf States, "Iran", various editions; New York Times, May 17, 1995, p. A-3; Los Angeles Times, May 18, 1995, p. 8. USCENTCOM reports only 1,000 tanks, but this may represent round for security purposes or a different way of estimating operational strength. USCENTCOM, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 14-15.

[262] IISS, Military Balance, 2000-2001.

[263] The low estimate of Iran's AFV and APC strength are based on interviews with Israeli, British and US civilian experts, and the IISS, Military Balance, 2000-2001, "Iran"; Jane's Sentinel: The Gulf States, "Iran", various editions; USCENTCOM reports a total of 1,360 other armored vehicles. USCENTCOM, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 14-15.

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[264]"International Defense Review, 7/1996, p. 24 Jane's Defense Weekly, January 7, 1995, p. 4; February 25, 1995, p. 4; Tehran Times, May 30, 1996.

[265] Based largely on interviews. For typical recent reporting on Iranian exercises, see Washington Times, May 12, 1997, p. A-13, October 11, 1997, p. A-6; Jane's Defense Weekly, June 25, 1997, p. 14, October 1, 1997, p. 19; Reuters, July 3, 1997, 0452, July 9, 1997, 1655, September 28, 1997, 0417, October 6, 1997, 1600.

[266] Jane's Defense Weekly, April 30, 1997, p. 33.

[267] Reports that One of these systems, the Fadjr 3 -- with a range of 40 kilometers -- has seen extensive service with the Hezbollah forces in Lebanon are not correct. Jane's Defense Weekly, November 6, 1996, p. 23, September 17, 1997, p. 5, December 10, 1997, p. 20, January 14, 1998, pp. 23-25; International Defense Review, 7/1996, pp. 24-27; Jane's Intelligence Review, September, 1997, pp. 419-421.

[268] USCENTCOM reports a total of 1,500 guns. USCENTCOM, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 14-15.

[269] USCENTCOM, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 14-15.

[270] This analysis draws on Anthony H. Cordesman, Iran and Iraq: The Threat from the Northern Gulf, Boulder, Westview, 1994; Anthony H. Cordesman and Ahmed S. Hashim, Iran: the Dilemmas of Dual Containment, Boulder, Westview, 1997; Jane's Sentinel: The Gulf States, "Iran;" Mark J. Roberts, Khomeini's Incorporation of the Iranian Military, Washington, Institute for National Security Studies, National Defense University, January, 1996; Ahmed Hashim, "The Crisis of the Iranian State," Adelphi Paper 296, London, IISS, Oxford, July 1995, pp. 7-30 and 50-70; Andrew Rathmell, The Changing Military Balance in the Gulf, London, RUSI, Whitehall Series, 1996, pp. 9-23; Michael Eisenstadt, Iranian Military Power, Capabilities and Intentions, Washington, Washington Institute, 1996, pp. 9-65; Anoushiravan Enreshami, "Iran Strives to Regain Military Might," International Defense Review, 7/1996, pp. 22-26; the Washington Times, May 2, 1989, p. A-9, June 23, 1989, p. A-9; March 1, 1992, p. B-3, March 22, 1989, p. A-8, January 17, 1992, p. A-1, February 20, 1992, p. 9; Armed Forces Journal, March 1992, pp. 26-27; Defense Electronics, March, 1992, p. 16; Inside the Air Force, February 28, 1992, p. 1; Jane's Defense Weekly, November 19, 1988, pp. 1252-1253, June 3, 1988, p. 1057, February 11, 1989, p. 219, June 30, 1990, pp. 1299-1302, February 11, 1992, p. 158-159; Dr. Andrew Rathmell, "Iran's Rearmament: How Great a Threat?," Jane's Intelligence Review, July, 1994, pp. 317-322; Armed Forces (UK), May, 1989, pp. 206-209; Washington Post, June 23, 1989, p. A-1; August 18, 1989, p. A-25; August 20, 1989, p. A-1, September 3, 1989, p. A-25, February 1, 1992, p. A-1 February 2, 1992, p. A-1, February 5, 1992, p. A-19; New York Times, September 3, 1989, p. A-4; The Estimate, October 13-26, 1989, p. 1; Christian Science Monitor, February 6, 1992, p. 19; Philadelphia Inquirer, February 6, 1992, p. A-6; Los Angeles Times, January 7, 1992, p. A-1; Baltimore Sun, January 25, 1992, p. 4A; Defense News, January 27, 1922, p. 45, February 17, 1992, p. 1; Chicago Tribune, January 19, 1992, p. 1.

[271] A review of Iranian media reporting and unclassified Iranian military literature does not clarify this situation. The Iranian media issue conflicting reports, and Iran's military literature does not seem to provide a definitive picture of the IRGC's military organization and actual command structure. This analysis is based largely on the views of US experts, but there may be more than 15 "brigades."

[272] A J Venter, "Iran Still Exporting Terrorism," Jane's Intelligence Review, November, 1997, pp. 511-516.

[273] Interviews with US experts. Division, brigade, regiment, and battalion are Western terms which do not really apply to IRGC formations. Actual unit strengths and organization often have nothing to do with the titles applied in Western reporting.

[274]. The reader should be aware that much of the information relating to the Quds is highly uncertain and is drawn from Israeli sources. Also, however, see the article from the Jordanian publication Al-Hadath in FBIS-NES-96-108, May 27, 1996, p. 9, and in Al-Sharq Al-Awsat, FBIS-NES-96-110, June 5, 1996, pp. 1,4; A J Venter, "Iran Still Exporting Terrorism," Jane's Intelligence Review, November, 1997, pp. 511-516.

[275] Adapted from interviews with US, British, and Israeli experts, Iranian exiles, Anthony H. Cordesman, Iran and Iraq: The Threat from the Northern Gulf, Boulder, Westview, 1994; Anthony H. Cordesman and Ahmed S.

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Hashim, Iran: the Dilemmas of Dual Containment, Boulder, Westview, 1997; John W. R. Taylor and Kenneth Munson, "Gallery of Middle East Air Power," Air Force, October, 1994, pp. 59-70; Jane's Sentinel: The Gulf States, "Iran", various editions; Ahmed Hashim, "The Crisis of the Iranian State," Adelphi Paper 296, London, IISS, Oxford, July 1995, pp. 7-30 and 50-70; Andrew Rathmell, The Changing Military Balance in the Gulf, London, RUSI, Whitehall Series, 1996, pp. 9-23; Michael Eisenstadt, Iranian Military Power, Capabilities and Intentions, Washington, Washington Institute, 1996, pp. 9-65; Anoushiravan Enreshami, "Iran Strives to Regain Military Might," International Defense Review, 7/1996, pp. 22-26; USNI Data Base. Military Technology, World Defense Almanac: The Balance of Military Power, Vol. XVII, Issue 1-1993, ISSN 0722-3226, pp. 139-142; Anoushiravan Ehteshami, "Iran's National Strategy," International Defense Review, 4/1994, pp. 29-37; and working data from the Jaffee Center for Strategic Studies and the Washington Times, January 16, 1992, p. G-4; Washington Post, February 1, 1992, p. A1, February 2, 1992, pp. A1 and A25, February 5, p. A-19; Financial Times, February 6, 1992, p. 4; Christian Science Monitor, February 6, 1992, p. 19; Defense News, February 17, 1992, p. 1; Kenneth Katzman and Scott Modell "Terrorism: Middle Eastern Groups and State Sponsors, 1997," Library of Congress, CRS-97-6924F, July 10, 1997.

[276] For example, see .Jane's Defense Weekly, June 24, 1995, p. 5, November 6, 1996, p. 23, June 25, 1997, p. 14; Washington Times, May 4, 1997, p. A7; May 12, 1997, p. A-13, Reuters, July 3, 1997, 0452, July 9, 1997, 1655; The Washington Post, June 30, 1997, p. A-20; Associated Press, June 30, 1996, 0629.

[277] The range of aircraft numbers shown reflects the broad uncertainties affecting the number of Iran's aircraft which are operational in any realistic sense. Many aircraft counted, however, cannot engage in sustained combat sorties in an extended air campaign. The numbers are drawn largely from interviews; Jane's Intelligence Review, Special Report No. 6, May, 1995; Jane's Sentinel: The Gulf States, "Iran", various editions; IISS, Military Balance, 2000-2001, "Iran;" Andrew Rathmell, The Changing Balance in the Gulf, London, Royal United Services Institute, Whitehall Papers 38, 1996; Dr. Andrew Rathmell, "Iran's Rearmament: How Great a Threat?," Jane's Intelligence Review, July, 1994, pp. 317-322; Jane's World Air Forces (CD-ROM).

[278] Jane's Defense Weekly, April 29, 1998, p. 17.

[279] Wall Street Journal, February 10, 1995, p. 19; Washington Times, February 10, 1995, p. A-19.

[280] Reports that Iran has some Chinese F-6 trainers in inventory are not correct. Based on interviews with British, Israeli, and US experts, and Anthony H. Cordesman, Iran and Iraq: The Threat from the Northern Gulf, Boulder, Westview, 1994; Anthony H. Cordesman and Ahmed S. Hashim, Iran: the Dilemmas of Dual Containment, Boulder, Westview, 1997; IISS, Military Balance, 2000-2001, "Iran"; Jane's Sentinel: The Gulf States, "Iran", various editions; USNI Data Base; Military Technology, World Defense Almanac: The Balance of Military Power, Vol. XVII, Issue 1-1993, ISSN 0722-3226, pp. 139-142; Ahmed Hashim, "The Crisis of the Iranian State," Adelphi Paper 296, London, IISS, Oxford, July 1995, pp. 7-30 and 50-70; Andrew Rathmell, The Changing Military Balance in the Gulf, London, RUSI, Whitehall Series, 1996, pp. 9-23; Michael Eisenstadt, Iranian Military Power, Capabilities and Intentions, Washington, Washington Institute, 1996, pp. 9-65; Anoushiravan Enreshami, "Iran Strives to Regain Military Might," International Defense Review, 7/1996, pp. 22-26; Anoushiravan Ehteshami, "Iran's National Strategy," International Defense Review, 4/1994, pp. 29-37; and working data from the Jaffee Center for Strategic Studies. US and Israeli experts do not confirm reports that Iran has ordered and taken delivery on 12 TU-22M Backfire bombers. There are some indications that it may have discussed such orders with the USSR.

[281] Jane's Sentinel: The Gulf States, "Iran", various editions.

[282] Office of Naval Intelligence, Worldwide Challenges to Naval Strike Warfare, Washington, Department of the Navy, January, 1996, p. 31.

[283] Based on interviews with British, Israeli, and US experts, and Anthony H. Cordesman, Iran and Iraq: The Threat from the Northern Gulf, Boulder, Westview, 1994; Anthony H. Cordesman and Ahmed S. Hashim, Iran: the Dilemmas of Dual Containment, Boulder, Westview, 1997; IISS, Military Balance, 2000-2001, "Iran"; Jane's Sentinel: The Gulf States, "Iran", various editions; USNI Data Base; Anoushiravan Ehteshami, "Iran's National

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[284] Jane's Defense Weekly, February 7, 1996, p. 14, March 27, 1996, p. 14.

[285] This analysis draws heavily on Jane's Fighting Ships, 1992-1993 , 1995-1996, and 1996-1997; US Naval Institute, The Naval Institute Guide to the Combat Fleets of the World, 1996, Their Ships, Aircraft, and Armament, Annapolis, Naval Institute, 1996; Anthony H. Cordesman, Iran and Iraq: The Threat from the Northern Gulf, Boulder, Westview, 1994; Anthony H. Cordesman and Ahmed S. Hashim, Iran: the Dilemmas of Dual Containment, Boulder, Westview, 1997; Anoushiravan Ehteshami, "Iran's National Strategy," International Defense Review, 4/1994, pp. 29-37; Andrew Rathmell, The Changing Military Balance in the Gulf, London, RUSI, Whitehall Series, 1996, pp. 9-23; Michael Eisenstadt, Iranian Military Power, Capabilities and Intentions, Washington, Washington Institute, 1996, pp. 9-65; Anoushiravan Enreshami, "Iran Strives to Regain Military Might," International Defense Review, 7/1996, pp. 22-26; IISS, Military Balance, 2000-2001, "Iran"; Jane's Sentinel: The Gulf States, "Iran", various editions; USNI Data Base. Military Technology, World Defense Almanac: The Balance of Military Power, Vol. XVII, Issue 1-1993, ISSN 0722-3226, pp. 139-142. USNI Data Base; Jane's Underwater Technology, 1997-1998; Jane's Underwater Warfare Systems, 1997-1998; Jane's Fighting Ships, 1997-1998; Jane's Naval Weapons Systems, 1997-1998.

[286] Interviews and USCENTCOM, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 14-15.

[287] Interviews and USCENTCOM, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 14-15; Jane's Jane's Sentinel: The Gulf States, "Iran", various editions; IISS, Military Balance, 2000-2001.

[288] IRNA April 21, 1997, May 2, 1997; Iranian TV, April 26, 1997;.Jane's Defense Weekly, April 23, 1997, p. 19, April 30, 1997, p. 6, June 24, 1995, p. 5, November 6, 1996, p. 23, June 25, 1997, p. 14; Washington Times, May 4, 1997, p. A7; May 12, 1997, p. A-13; Reuters, April 23, 1997, 0818, May 7, 1997, 0452, July 3, 1997, 0452, July 9, 1997, 1655; The Washington Post, April 30, 1997, p. 6; April 23, 1997, p. 19, April 30, 1997, p. 6, June 30, 1997, p. A-20; Associated Press, June 30, 1996, 0629; May 7, 1997, 0452, July 3, 1997, 0452, July 9, 1997, 1655.

[289] Adapted from the IISS, Annapolis, and JCSS data bases, and the Washington Times, January 16, 1992, p. G-4; Washington Post, February 1, 1992, p. A1, February 2, 1992, pp. A1 and A25, February 5, p. A-19; Financial Times, February 6, 1992, p. 4; Christian Science Monitor, February 6, 1992, p. 19; Defense News, February 17, 1992, p. 1; Jane's Defense Weekly, October 29, 1997, p. 4.

[290] IRNA April 21, 1997, May 2, 1997; Iranian TV, April 26, 1997;.Jane's Defense Weekly, October 7, 1995, p. 22, April 23, 1997, p. 19, April 30, 1997, p. 6, June 24, 1995, p. 5, November 6, 1996, p. 23, June 25, 1997, p. 14, October 29, 1997, p. 4; Washington Times, May 4, 1997, p. A7; May 12, 1997, p. A-13; Reuters, April 23, 1997, 0818, May 7, 1997, 0452, July 3, 1997, 0452, July 9, 1997, 1655; The Washington Post, April 30, 1997, p. 6; April 23, 1997, p. 19, April 30, 1997, p. 6, June 30, 1997, p. A-20; Associated Press, June 30, 1996, 0629; May 7, 1997, 0452, July 3, 1997, 0452, July 9, 1997, 1655.

[291] The Economist, September 23, 2000, p. 54.

[292] Reuters, October 4, 2000, 0530.

[293] Middle East Economic Survey, vol. 42, no. 51, December 20, 1999, pp. A1, A2. Also see, Middle East Economic Survey, vol. 42, no. 52, December27/Jan 3, 2000, p. A1.

[294] EIA country report on Iraq, September 2000, www.eia.doe.gov/emeu/cabs/iraqfull.html.

[295] EIA country report on Iraq, September 2000, www.eia.doe.gov/emeu/cabs/iraqfull.html.

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[299] Reuters, February 9, 2000, 1913.
[300] EIA country report on Iraq, September 2000, www.eia.doe.gov/emeu/cabs/iraqfull.html.
[301] New York Times, October 4, 2000, p. A-5.
[302] EIA, "World Energy Sanctions," April 29, 1999, http://www.eia.doe.gov/emeu/cabs/sanction.html; and EIA, "World Energy Areas to Watch," August 2000, http://www.eia.doe.gov/emeu/cabs/hot.html.
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[305] Department of Energy, Energy Information Agency, International Energy Outlook, DOE/EIA-04884(98), April, 1998, pp. 36, 175-178; Department of Energy, Energy Information Agency, International Energy Outlook, DOE/EIA-0484(00), pg. 229, 232-3.
[306] EIA, "OPEC Revenues Fact Sheet," June 2000, www.eia.doe.gov/emeu/cabs/pgulf.html; EIA, "World Energy Sanctions," April 29, 1999, http://www.eia.doe.gov/emeu/cabs/sanction.html; and EIA, "World Energy Areas to Watch," August 2000, http://www.eia.doe.gov/emeu/cabs/hot.html.
[307] EIA, "OPEC Revenues Fact Sheet," June 2000, www.eia.doe.gov/emeu/cabs/pgulf.html; EIA, "World Energy Sanctions," April 29, 1999, http://www.eia.doe.gov/emeu/cabs/sanction.html; and EIA, "World Energy Areas to Watch," August 2000, http://www.eia.doe.gov/emeu/cabs/hot.html.
[308] EIA, "OPEC Revenues Fact Sheet," June 2000, www.eia.doe.gov/emeu/cabs/pgulf.html; EIA, "World Energy Sanctions," April 29, 1999, http://www.eia.doe.gov/emeu/cabs/sanction.html; and EIA, "World Energy Areas to Watch," August 2000, http://www.eia.doe.gov/emeu/cabs/hot.html.
[309] EIA country report on Iraq, September 2000, www.eia.doe.gov/emeu/cabs/iraqfull.html.
[310] EIA country report on Iraq, September 2000, www.eia.doe.gov/emeu/cabs/iraqfull.html.
[311] EIA country report on Iraq, September 2000, www.eia.doe.gov/emeu/cabs/iraqfull.html.
[312] EIA, "World Energy Sanctions," April 29, 1999, http://www.eia.doe.gov/emeu/cabs/sanction.html; and EIA, "World Energy Areas to Watch," August 2000, http://www.eia.doe.gov/emeu/cabs/hot.html.
[313] EIA country report on Iraq, September 2000, www.eia.doe.gov/emeu/cabs/iraqfull.html.
[314] EIA country report on Iraq, September 2000, www.eia.doe.gov/emeu/cabs/iraqfull.html.
[315] These figures are drawn from the US Arms Control and Disarmament Agency (ACDA) data base presented in World Military Expenditures and Arms Transfers, Washington, GPO, editions for 1991-1992 and 1996, as converted into constant 1997 dollars using the OMB deflators issues for the FY1998 federal budget.
[316] There is sometimes confusion over the fact the UN made repeated efforts to offer the Iraqi government humanitarian relief. The chronology of such resolutions is summarized below:

- Resolution 1302 of 8 June 2000 - renews the oil for food program for another 180 days until 5 December 2000.
- Resolution 1293 of 31 March 2000 - increases oil spare parts allocation from $300 million to $600 million under phases VI and VII.
- Resolution 1284 of 17 December 1999 - stresses the importance of a comprehensive approach to the full implementation of all relevant Security Council resolutions regarding Iraq and the need for Iraqi compliance with these resolutions. Establishes, as a subsidiary body of the Council, the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) which replaces the Special Commission.
- Resolution 1281 of 10 December 1999 - renews the oil for food program for a further six months.
- Resolution 1280 of 3 December 1999 - extends phase VI of the oil for food program for one week, until 11 December 1999.
- Resolution 1275 of 19 November 1999 - extends phase VI of the oil for food program for two weeks, until 4 December 1999.

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- Resolution 1266 of 4 October 1999, permits Iraq to export an additional amount of $3.04 billion of oil in phase VI to make up for the deficit in revenue in phases IV and V.
- Resolution 1242 of 21 May1999 - renews the oil for food program for a further six months.
- Resolution 1210 of 24 November 1998, renews the oil for food program for a further six months from 26 November at the higher levels established by resolution 1153 and including additional oil spare parts.
- Resolution 1175 of 19 June 1998, authorizes Iraq to buy $300 million worth of oil spare parts in order to reach the ceiling of $5.256 billion.
- Resolution 1158 of 25 March 1998, permits Iraq to export additional oil in the 90 days from 5 March, 1998 to compensate for delayed resumption of oil production and reduced oil prices.
- Resolution 1153 of 20 February 1998, allows the export of $5.256 billion of Iraqi oil.
- Resolution 1143 of 4 December 1997, extends the oil-for-food Program for another 180 days
- Resolution 1129 of 12 September 1997, decides that the provisions of resolution 1111 (1997) should remain in force, but authorizes special provisions to allow Iraq to sell petroleum in a more favorable time frame.
- Resolution 1111 of 4 June 1997, extends the term of SCR 986 (1995) another 180 days.
- Resolution 1051 of 27 March 1996, establishes the export/import monitoring system for Iraq.
- Resolution 986 of 14 April 1995, enables Iraq to sell up to $1 billion of oil every 90 days and use the proceeds for humanitarian supplies to the country; and sets terms of reference for the Oil-for-Food Program.
- Resolution 778 of 2 October 1992, authorizes transferring back money produced by any Iraqi oil transaction on or after 6 Aug 90 and which had been deposited into the Escrow account, to the states or accounts concerned for so long as the oil exports take place or until sanctions are lifted.
- Resolution 712 of 19 September 1991, confirms the sum of $1.6 billion to be raised by the sale of Iraqi oil in a six month period to fund an oil for food program.
- Resolution 706 of 15 August 1991, sets outs a mechanism for an oil-for-food program and authorizes an escrow account to be established by the Secretary-General.
- Resolution 687 of 3 April 1991, sets terms for a cease-fire, maintains the terms of the embargo.
- Resolution 661 of 6 August 1990, imposes comprehensive economic sanctions on Iraq exempting food and medicine and establishes the 661 Committee to oversee implementation of the sanctions.

[317] The text of the recent WHO and FAO reports is available on the Internet, as well as from UN bookstores, and the reader should carefully examine the original reports. They uncritically accept Iraqi figures for the base year of 1990, ignore the previous impact of the Iran-Iraq War, ignore Iraq's civil wars against its Kurds and Shi'ites, do not describe the sampling techniques used in detail, ignore the real-world increase in food output available in Iraqi markets in 1994-1997, imply Iraq's agricultural problems are totally import-driven rather than the result of Iraqi government policy and even sometimes argue that a shift away from reliance on food imports is damaging the Iraqi environment. Data for recent years are often lacking or drawn from Iraqi inputs that are directly contradicted by Iraqi reporting in other sources. For example, the WHO reports make claims about lasting damage to Iraqi water purification plants without any analysis of the actual damage done during the Gulf War or mention of Iraqi claims to have repaired the infrastructure involved. The standards of reporting and analysis used by the WHO and FAO are so unbelievably low and politically naive that they could not survive minimal peer group review in any normal research effort and cast doubt on the professional integrity of both organizations.

[318] Reuters, June 22, 1999, 0942

[319] Agence France Presse, August 13, 1999, 11:22.

[320] For a picture of the resulting confusion in using the UNICEF report, and more statistical detail, see Middle East Research and Information Project, Press Information Note 7, September 21, 1999, gkbishara@mindspring.com.

[321] The Associated Press, October 20, 17:56.

[322] Reuters, October 29, 2000, 0453.

[323] CIA, World Factbook, 1996, Washington, GPO, 1997 "Iraq," Reuters, October 16, 1997, 0921.

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[324] CIA, World Factbook, 1996, Washington, GPO, 1997 "Iraq"; CIA, World Factbook, 1990, Washington, GPO, 1991 "Iraq".
[325] Saddam Hussein's Iraq, Prepared by the U.S. Department of State, Released September 13, 1999 (updated 3/24/00). http://www.usia.gov/regional/nea/nea.htm.
[326] Reuters, September 17, 1999, 0321.
[327] James P. Rubin, State Department Spokesman, Excerpt from the Daily Press Briefing, Department of State Press Briefing Room, Washington, DC, March 24, 2000.
[328] Reuters, August 18, 2000, 1050.
[329] Reuters, August 21, 2000, 1118.
[330] Reuters, March 14, 2000 0611.
[331] Judy Aita Washington File United Nations Correspondent, "Iraq Refuses to Cooperate with UN on Humanitarian Aid Survey (Annan reports on oil-for-food program)," September 12, 2000Office of International Information Programs, U.S. Department of State. Web site: http://usinfo.state.gov)
[332] Economist, February 12, 2000, pp. 41-42.
[333] Associated Press, February 9, 2000, 1527.
[334] EIA, "OPEC Revenues Fact Sheet," June 2000, www.eia.doe.gov/emeu/cabs/pgulf.html; EIA, "World Energy Sanctions," April 29, 1999, http://www.eia.doe.gov/emeu/cabs/sanction.html; and EIA, "World Energy Areas to Watch," August 2000, http://www.eia.doe.gov/emeu/cabs/hot.html.
[335] New York Times, September 12, 2000, pp. A-1 and A-10.
[336] The author has repeatedly visited Iraq since 1973, and talked to many serving Iraqi officers during the Iran-Iraq War. While such officers never directly criticized Saddam, their discussions of the "high command" often did so in ways that clearly referred to the President. Discussions with defectors in Jordan and Europe since the Gulf War indicate that this situation has grown worse since 1992, and still worse since the defection of Hussein Kamel Majiid in 1995.
[337] Washington Post, April 15, 1992, p. A-32, July 3, p. A-1, July 4, 1992, p. A-14, July 10, 1992, p. A-14; New York Times, July 4, 1992, p. A-4, July 6, 1992, p. A-6, July 7, 1992, p. A-3, July 10, 1992, p. A-3 .
[338] The Sunday Times, April 18, 1993, p. 19; discussions with Amatzia Baram.
[339] Washington Post, October 4, 1992, p. A-35.
[340] Many of the details in this analysis are based on discussions with Amatzia Baram.
[341] Baltimore Sun, April 15, 1993, p. 6A; Washington Times, April 27, 1993, p. A-2.
[342] Philadelphia Inquirer, August 5, 1996, p. A-3; UPI, July 7, 1996, 1158; Associated Press July 12, 1996, 0940; Washington Times, August 12, 1996, p. A-1 and August 15, 1996, p. A-15; Wall Street Journal, February 26, 1996, p. A-8.
[343] Washington Post, September 1996, p. A-1.
[344] Sean Boyne, "Inside Iraq's Security Network," Jane's Intelligence Review, July, 1997, pp. 312-316 and August, 1997, pp. 365-367.
[345] US State Department Human Rights Report, 1996, Internet version.
[346] Washington Times, July 13, 1995, p. A-5; November 22, 1995, p. A-12; United Press, February 1, 1996, 0932.
[347] US State Department Human Rights Report, 1996, Internet version.
[348] USCENTCOM map, supplied June, 1996.
[349] CIA, World Factbook, 1996, Washington, GPO, 1997, and IISS, Military Balance, 2000-2001.
[350] USCENTCOM briefing by "senior military official," Pentagon, January 28, 1997, pp. 2, 5-8 10; Jane's Defense Weekly, July 9, 1997, p. 4.
[351] Table I in Bureau of Arms Control, US State Department, World Military Expenditures and Arms Transfers, 1998, Washington, GPO, 200.
[352] IISS, Military Balance, various editions.

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[353] Arms Control and Disarmament Agency (ACDA), World Military Expenditures and Arms Transfers, 1989, Washington, GPO, 1990, p. 117.

[354] Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1985-1992, Washington, Congressional Research Service, CRS-93-656F, July 19, 1993, pp. CRS-67, 68, 69, 70; Kenneth Katzman, "Iraq's Campaign to Acquire and Develop High technology," Congressional Research Service, CRS-92-611F, August 3, 1991. US reporting on this subject is inconsistent. Arms Control and Disarmament Agency (ACDA), World Military Expenditures and Arms Transfers, 1990, Washington, GPO, 1992, p. 133. indicates that Iraq imported a total of $22,750 million worth of arms during 1985-1989, including $13,000 million from the Soviet Union, $1,700 million from France, $20 million from the UK, $1,600 million from the PRC, $90 million from West Germany, $2,900 million from other Warsaw Pact countries, $1,500 million from other European countries, $420 million from other Middle Eastern countries, $20 million from other East Asian states, $1,300 million from Latin American, and $200 million from other countries in the world.

[355] Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1985-1992, Washington, Congressional Research Service, CRS-93-656F, July 19, 1993, pp. CRS-56, 57, 58, 59.

[356] Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1989-1996, Washington, Congressional Research Service, CRS-97-778F, August 13, 1997.

[357] Richard F. Grimmett, Conventional Arms Transfers to the Third World, 1983-1990, Washington, Congressional Research Service, CRS-9 1-578F, August 2, 1991, Conventional Arms Transfers to the Third World, 1984-1991, Washington, Congressional Research Service, CRS-92-577F, July 20, 1991, Conventional Arms Transfers to the Third World, 1987-1994, Washington, Congressional Research Service, CRS-95-862F, August 4, 1995; Conventional Arms Transfers to the Third World, 1988-1956, Washington, Congressional Research Service, CRS-96-667F, August 15, 1996; and , Conventional Arms Transfers to the Third World, 1989-1996, Washington, Congressional Research Service, CRS-97-778F, August 13, 1997; Conventional Arms Transfers to the Third World, 1991-1998, Washington, Congressional Research Service, CRS-9 1-578F, August 2, 1991, Conventional Arms Transfers to the Third World, 1984-1991, Washington, Congressional Research Service, CRS-RL30275, August 18, 2000. Expenditures less than $50 million are not reported. All data are rounded to the nearest $100 million. Major West European includes Britain, France, Germany, and Italy. Also see Table II in Bureau of Arms Control, US State Department, World Military Expenditures and Arms Transfers, 1998, Washington, GPO, 2000.

[358] Author's estimate based on interviews, EIU reports, the IISS, Military Balance, and CIA, World Factbook.

[359] USCENTCOM briefing by “senior military official,” Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13.

[360] Reuters, September 4, 1996, 0911; Jane’s Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13.

[361] Based on interviews.

[362] Estimate provided by USCENTCOM in June, 1996 plus US Central Command, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 16-18. Also based on interviews.

[363] Estimate provided by USCENTCOM in June, 1996 plus US Central Command, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 16-18. Also based on interviews.

[364] USCENTCOM briefing by “senior military official,” Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane’s Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13.

[365] USCENTCOM briefing by “senior military official,” Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane’s Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13.

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[366] USCENTCOM briefing by "senior military official," Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane's Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13.

[367] IISS, The Military Balance, 2000-2001

[368] See the detailed history of the attack on Republican Guards units and the resulting losses by name in Department of Defense, The Conduct of the Persian Gulf War: Final Report, Washington, Department of Defense, April, 1992, pp. 93-95, 104-113, 355, 401. Also references in the April 15, 1993 draft of the US Air Force Gulf War Air Power Survey, pp. 9-10.

[369] The author has drawn on interviews with various US and foreign experts; USCENTCOM briefing by "senior military official," Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane's Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13.

[370] Jane's Pointer, May 1998, p. 6

[371] Sean Boyne, "Inside Iraq's Security Network," Jane's Intelligence Review, July, 1997, pp. 312-316 and August, 1997, pp. 365-367.

[372] Sean Boyne, "Qusay considers a reshuffle for Iraq's command structure," Jane's Intelligence Review, September 1997, pp. 416-417; Sean Boyne, "Inside Iraq's Security Network," Jane's Intelligence Review, July, 1997, pp. 312-316 and August, 1997, pp. 365-367.

[373] Sean Boyne, "Qusay considers a reshuffle for Iraq's command structure," Jane's Intelligence Review, September 1997, pp. 416-417; Sean Boyne, "Inside Iraq's Security Network," Jane's Intelligence Review, July, 1997, pp. 312-316 and August, 1997, pp. 365-367.

[374] These estimates are based primarily on interviews with various experts, and USCENTCOM briefing by "senior military official, Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane's Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13.

[375] Discussions with US experts and USCENTCOM, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 16-17.

[376] A few experts estimate that Iraq only has about 2,000-2,300 fully operational other armored vehicles. Additional sources include interviews in the US, London, Switzerland, and Israel.

[377] IISS, The Military Balance, 2000-2001.

[378] These estimates are based primarily on interviews with various experts, and USCENTCOM briefing by "senior military official," Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane's Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13.

[379] Some estimates go as high as 500. It is doubtful that this many are operational and/or armed.

[380] IISS, The Military Balance, 2000-2001.

[381] US Central Command, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 16-18.

[382] Many different lists exist of the names of such bases. Jane's lists Al Amarah, Al Asad, Al Bakr, Al Basrah - West Maqal, Al Khalid, Al Kut, Al Qayyarah, Al Rashid, Al Taqaddum, Al Walid, Artawi, As Salman, As Samara, As Zubair, Baghdad-Muthenna, Balada, Bashur, Erbil, Jalibah, Karbala, Radif al Khafi, Kirkuk, Mosul, Mudaysis, Nejef, Qal'at Sikar, Qurna, Rumaylah, Safwan, Shibah, Shyaka Mayhar, Sulyamaniya, Tal Afar, Tallil-As Nasiryah, Tammuz, Tikrit, Ubdaydah bin al Jarrah, and Wadi Al Khirr. Many of the bases on this list are of limited size or are largely dispersal facilities. See Jane's Sentinel: The Gulf States, "Iraq," London, Jane's Publishing, 1997, p. 22.

[383] US Central Command, Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 16-18.

[384] IISS, The Military Balance, 2000-2001.

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[385] Washington Times, September 5, 1996, p. A-1.
[386] In addition to the sources listed at the start of the Iraq section, see USCENTCOM briefing by "senior military official, Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane's Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13; The IISS, Military Balance, 2000-2001; Jane's Sentinel: The Gulf States, various editions; Andrew Rathmell, The Changing Balance in the Gulf, London, Royal United Services Institute, Whitehall Papers 38, 1996; Edward B. Atkenson, The Powder Keg, Falls Church, NOVA Publications, 1996; Geoffery Kemp and Robert E. Harkavy, Strategic Geography and the Changing Middle East, Washington, Carnegie Endowment/Brookings, 1997; and Michael Eisenstadt, Like a Phoenix from the Ashes? The Future of Iraqi Military Power, Washington, The Washington Institute, Policy Paper 36, 1993.
[387] USCENTCOM briefing by "senior military official," Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane's Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Jane's Sentinel: The Gulf States, various editions.
[388] Washington Post, October 25, 2000, p. A24.
[389] USCENTCOM briefing by "senior military official," Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane's Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13; Jane's Sentinel: The Gulf States, various editions.
[390] The reader should be aware that these estimates are extremely uncertain and are based largely on expert estimates of the losses during the Gulf War. There is a sharp difference of opinion among some US experts as to the size of Iraq's losses during the conflict. The US Central Command lists 150 SA-2 launchers, 110 SA-3 launchers, 150 SA-6/SA-8 launchers, 30 Roland VII launchers, and 5 Crotale launchers in Atlas, 1996, MacDill Air Force Base, USCENTCOM, 1997, pp. 16-18. Also see USCENTCOM briefing by "senior military official, Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane's Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13; The IISS, Military Balance, 2000-2001; and Jane's Sentinel: The Gulf States, various editions. Other sources include Andrew Rathmell, The Changing Balance in the Gulf, London, Royal United Services Institute, Whitehall Papers 38, 1996; Edward B. Atkenson, The Powder Keg, Falls Church, NOVA Publications, 1996; Geoffery Kemp and Robert E. Harkavy, Strategic Geography and the Changing Middle East, Washington, Carnegie Endowment/Brookings, 1997, and Michael Eisenstadt, Like a Phoenix from the Ashes? The Future of Iraqi Military Power, Washington, The Washington Institute, Policy Paper 36, 1993.
[391] USCENTCOM briefing by "senior military official, Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane's Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13; The IISS, Military Balance, 1996/1997, and 2000-2001, and the Jane's Sentinel series.
[392] Wall Street Journal, August 19, 1992, p. A-3; USCENTCOM briefing by "senior military official, Pentagon, January 28, 1997, pp. 2, 5-8 10; Washington Times, February 1, 1997, p. A-13; Reuters, September 4, 1996, 0911; Jane's Pointer, November 1994, p. 2; Associated Press September 9, 1996, 0129; Washington Times, January 30, 1997, p. A-3; February 1, 1997, p. A-13; The IISS, Military Balance, 2000-2001, and Jane's Sentinel: The Gulf States, various editions.
[393] Michael Eisenstadt, "The Iraqi Armed Forces Two Years On," Jane's Intelligence Review, pp. 121-127. March, 1993; Jane's Sentinel: The Gulf States, various editions.
[394] See Sean Boyne, "Iraq's MIO: Ministry of Missing Weapons," Jane's Intelligence Review, March, 1998, pp. 23-25.
[395] Washington Post, October 25, 2000, p. A24.
[396] Based on interviews with British, US, Russian, and Israeli experts.

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[397] This analysis draws heavily on interviews and various editions of US Naval Institute, The Naval Institute Guide to the Combat Fleets of the World, , Their Ships, Aircraft, and Armament, Annapolis, Naval Institute; Jane's Fighting Ships, the IISS, The Military Balance, IISS, London; USNI Data Base .

[398] Office of the Secretary of State, Office of the Coordinator for Counterterrorism, Patterns of Global Terrorism: 1999, Department of State Publication 10687.

[399] This analysis of sanctions is based largely on EIA, "World Energy Sanctions," April 29, 1999, http://www.eia.doe.gov/emeu/cabs/sanction.html, and EIA, "World Energy Areas to Watch," August 2000, http://www.eia.doe.gov/emeu/cabs/hot.html.

[400] Washington Post, October 25, 2000, p. A-24.

[401] General Tommy R. Franks, commander-in-chief, U.S. Central Command (USCENTCOM), Remarks Before Armed Services Committee on Iraq, September 19, 2000.

[402] Source: Estimate made by Anthony H. Cordesman based on the equipment counts in IISS, Military Balance, "Iran," and discussions with US experts. Note that different equipment estimates are used later in the text. The IISS figures are used throughout this chart to preserve statistical consistency.

[403] Source: Estimate made by Anthony H. Cordesman based on the equipment counts in IISS, Military Balance, "Iran," and discussions with US experts. Note that different equipment estimates are used later in the text. The IISS figures are used throughout this chart to preserve statistical consistency.

[404] See General Anthony C. Zinni, Commander in Chief, US Central Command, "Shaping the Central Region for the 21st Century," USCENTCOM, Public Affairs Office, MacDill Air Force Base, 2000, http://www.Centcom.mil.

[405] Reuters, November 4, 1995, 1022.

[406] William S. Cohen, 2000 Annual Report to the President and the Congress, Washington. Department of Defense, February 2000, Chapter I.

[407] Data provided by the US Army staff, November, 1996; William S. Cohen, 2000 Annual Report to the President and the Congress, Washington. Department of Defense, February 2000, Annex D; and Web page of the House Armed Services Committee, Service Chiefs Hearing, September 27, 2000, Contact: Maureen Cragin. Ryan Vaart, (202) 225-2539.

[408] Data provided by the US Navy and USMC staff, December, 1996; William S. Cohen, 2000 Annual Report to the President and the Congress, Washington. Department of Defense, February 2000, Annex D; and Web page of the House Armed Services Committee, Service Chiefs Hearing, September 27, 2000, Contact: Maureen Cragin. Ryan Vaart, (202) 225-2539..

[409] Data provided by the US Air Force staff, December, 1996; William S. Cohen, 2000 Annual Report to the President and the Congress, Washington. Department of Defense, February 2000, Annex D; and Web page of the House Armed Services Committee, Service Chiefs Hearing, September 27, 2000, Contact: Maureen Cragin. Ryan Vaart, (202) 225-2539.

[410] The Congressional Budget Office carried out the study using data from the Department of Defense and the Office of Management and Budget, as shown in "Budgeting for Defense: Maintain Today's Forces," Washington, CBO, September 2000, cbo.gov.

[411] Statement of Dan L. Crippen, Director, Budgeting for Defense: Maintaining Today's Forces before the Committee on the Budget, United States Senate, September 14, 2000.

[412] Secretary of Defense William Cohen, Report on the 1997 Quadrennial Defense Review, Chapter III, http://www.defenselink.mil/pubs/index.html#Reports.

[413] US General Accounting Office, Future Years Defense Program, Comparison of Planned Funding Levels for the 2000 and 2001 Programs, Report to the Chairman, Committee on the Budget, House of Representatives, GAO/NSIAD-00-179, June 2000.

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[414] US General Accounting Office, Future Years Defense Program, Comparison of Planned Funding Levels for the 2000 and 2001 Programs, Report to the Chairman, Committee on the Budget, House of Representatives, GAO/NSIAD-00-179, June 2000.
[415] Web page of the House Armed Services Committee, Service Chiefs Hearing, September 27, 2000, Contact: Maureen Cragin. Ryan Vaart, (202) 225-2539.
[416] US General Accounting Office, Defense Budget: Fiscal Year 2000 contingency Operations Costs and Funding, Report to the Chairman and Ranking Member, Subcommittee on Defense Appropriations, US Senate, GAO/NSIAD-00-168, June 2000.
[417] US General Accounting Office, Defense Budget: Fiscal Year 2000 contingency Operations Costs and Funding, Report to the Chairman and Ranking Member, Subcommittee on Defense Appropriations, US Senate, GAO/NSIAD-00-168, June 2000, pp. 12-14.
[418] US General Accounting Office, Defense Budget: Fiscal Year 2000 contingency Operations Costs and Funding, Report to the Chairman and Ranking Member, Subcommittee on Defense Appropriations, US Senate, GAO/NSIAD-00-168, June 2000, p. 5
[419] The Congressional Budget Office carried out the study using data from the Department of Defense and the Office of Management and Budget, as shown in "Budgeting for Defense: Maintain Today's Forces," Washington, CBO, September 2000, cbo.gov.
[420] Secretary of Defense William Cohen, Report on the 1997 Quadrennial Defense Review, Chapter III, http://www.defenselink.mil/pubs/index.html#Reports.
[421] The unclassified portions of the Department of Defense data base for the Conduct of the War or "COW" study reveal many cases where the US used more than 50% of its inventory of special purpose equipment, weapons systems, and stocks for the Gulf War. For example, the US Army used more than 76% of many of its world-wide stocks of key types of logistic vehicles in spite of massive assistance from host countries, and Japanese aid in providing civilian vehicles.
[422] Interviews and Defense News, September 25, 1995, p. 10.
[423] Unless otherwise stated, the primary sources are Secretary of Defense William S. Cohen, Annual Report to the President and the Congress, 2000, Washington, Department of Defense, 2000. Chapter 5; and Web page of the House Armed Services Committee, Service Chiefs Hearing, September 27, 2000, Contact: Maureen Cragin. Ryan Vaart, (202) 225-2539.
[424] US Army briefing sheets, 1994.
[425] Army, October ,1994, p. 189-191; Armed Forces Journal, August, 1995, pp. 28-30.
[426] Interviews, Defense News, April 1, 1996, p. 30; Secretary of Defense William S. Cohen, Report on the 1997 Quadrennial Defense Review, Chapter 8, http://www.defenselink.mil/pubs/index.html#Reports; Secretary of Defense William S. Cohen, Annual Report to the President and the Congress, 2000, Washington, Department of Defense, 2000.
[427] The FY 2001–2005 program supports an aircraft carrier force structure of 12 fully deployable units. At the end of FY 2001, the carrier force will consist of nine nuclear–powered vessels—eight of the CVN–68 Nimitz class plus the Enterprise (CVN–65)—and three conventionally–powered units. One of these ships, the J. F. Kennedy (CV–67), has been serving as an active as well as a reserve/training asset. The FY 2001 budget redesignates this ship as an active unit, enabling it to be incorporated fully into the carrier deployment schedule.
The newest Nimitz–class aircraft carrier, Ronald Reagan (CVN–76), will join the fleet in FY 2003, replacing the Constellation (CV–64). At that point, two conventionally–powered carriers—Kitty Hawk (CV–63), stationed in Yokosuka, Japan, and the J. F. Kennedy—will remain in the fleet. The Kitty Hawk will be retired in FY 2008, when CVN–77 enters service. The first of the Nimitz–class follow–on ships, designated CVNX, will enter construction in FY 2006 and join the fleet around FY 2013, replacing the Enterprise (CVN–65), which will then have seen more than 50 years of service. The second CVNX will replace the J. F. Kennedy about five years later,

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when that carrier is about 50 years old. Secretary of Defense William S. Cohen, Annual Report to the President and the Congress, 2000, Washington, Department of Defense, 2000, Chapter 5.

[428] Secretary of Defense William S. Cohen, Annual Report to the President and the Congress, 2000, Washington, Department of Defense, 2000, Chapter 5.

[429] Defense News, September 25, 1995, p. 4.

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[431] Armed Forces Journal, June, 1995, p. 46.

[432] Secretary of Defense William S. Cohen, Report on the 1997 Quadrennial Defense Review, Chapter 8, http://www.defenselink.mil/pubs/index.html#Reports; Secretary of Defense William S. Cohen, Annual Report to the President and the Congress, 2000, Washington, Department of Defense, 2000, Chapter 5.

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[434] Ibid.

[435] Secretary of Defense William J. Perry, Annual Report to the President and the Congress, Department of Defense, Washington, February, 1995, p. 219-220.

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[437] USAF briefings and briefing sheets, December, 1994; Air Force Times, December 19, 1994, p. 22.

[438] For a good overview and survey of the history id this subject, see Steven M. Kosiak, "Challenges & Opportunities: US Nonproliferation and Counterproliferation Programs in 1996," Washington, Center for Strategic and Budgetary Assessments, February, 1996, pp. 25-30. For the current status of US programs, see Department of Defense, "Chemical and Biological Defense Program, Annual Report to Congress," March 2000, and Department of Defense, "Nuclear/Biological/Chemical (NBC) Defense, Annual Report to Congress, March, 1999.

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[443] Office of the Secretary of Defense, United States Security Strategy for the Middle East, Washington, Department of Defense, 1995, p. 13.

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[451] See US State Department, Patterns of Global Terrorism: 1999, Department of State Publication 10687, Office of the Secretary of State, Office of the Coordinator for Counterterrorism, 2000, Appendix C.

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[455] National Intelligence Council, "Foreign Missile Developments and the Ballistic Missile Threat to the United States Through 2015, (September 1999 (www.cia.gov/cia/publications/nie/nie99). Also see the report of the Rumsfeld Commission, Commission to Assess the Ballistic Missile Threat to the United States, Executive Summary, July 15, 1998, pp. 6-7. Also see the report of the Rumsfeld Commission, Commission to Assess the Ballistic Missile Threat to the United States, Executive Summary, July 15, 1998, pp. 7.
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