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# **Iran's Developing Military Capabilities**

## **Executive Summary**

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Please note that this document is a working draft and will be revised. To comment, or to provide suggestions and corrections to the authors, please e-mail them at [acordesman@aol.com](mailto:acordesman@aol.com) and [PBaetjer@csis.org](mailto:PBaetjer@csis.org).

Iran is a nation with a mixed record in terms of Gulf and regional security. It no longer actively seeks to export its religious revolution to other Islamic states. It reached a rapprochement with Saudi Arabia and the other Southern Gulf states in the late 1990s. It has since avoided further efforts to try to use the Pilgrimage to attack the Kingdom, or to exploit Shi'ite versus Sunni tensions in Saudi Arabia and other Gulf countries like Bahrain. Iran maintains an active presence in the Gulf, conducts large scale-exercises, and maintains an active intelligence and surveillance presence in both the Gulf and neighboring states. It has avoided provocative military action, however, and there is no evidence of active hostile attacks on Southern Gulf targets or US targets since the Al Khobar bombings.

On the other hand, Iran no longer seems to be evolving towards a more moderate and democratic regime. It deals at at least low levels with outside terrorist groups. It actively supports the Hezbollah in Lebanon and hard-line groups like Hamas and the Palestian Islamic Jihad in attacking Israel. Iran is also well aware that Sunni and Shi'ite tensions are rising throughout the Islamic world, driven in part by Salafi extremist and terrorist groups like Al Qaeda. Iran plays at least some role in the political instability in Iraq and may take a more aggressive role in trying to shape Iraq's political future and security position in the Gulf..

Iran is a far less modern military power in comparative terms than it was during the time of the Shah, or during the Iran-Iraq War. Nevertheless, it is slowly improving its conventional forces, and is now the only regional military power that poses a serious conventional military threat to Gulf stability. Iran has significant capabilities for asymmetric warfare, and poses the additional threat of proliferation. There is considerable evidence that it is developing both a long-range missile force and a range of weapons of mass destruction. It has never properly declared its holdings of chemical weapons, and the status of its biological weapons programs is unknown. The disclosures made by the IAEA since 2002 indicate that it is likely that Iran will continue to covertly seek nuclear weapons.

## **Iranian Conventional Forces**

Most of Iran's military equipment is aging or second rate and much of it is worn. Iran lost some 50-60% of its land order of battle in the climatic battles of the Iran-Iraq War, and it has never had large-scale access to the modern weapons and military technology necessary to replace them. It also has lacked the ability to find a stable source of parts and supplies for most of its Western-supplied equipment, and has not have access to upgrades and modernization programs since the fall of the Shah in 1979.

Iran has, however, been able to rebuild some of its conventional capabilities during 1988-2003, and make progress towards acquiring weapons of mass destruction and long-range missiles. Iran faced major financial problems until the mid-1990s and could not obtain resupply or new weapons from most Western states. It has since, however, been able to acquire more significant numbers of weapons, particularly land-based weapons. According to US intelligence estimates, Iran imported \$2.0 billion worth of arms during 1996-1999, and \$600 million from 2000-2003. Iran signed \$1,700 million worth of new arms agreements during 1996-1999, and \$500 million in new arms agreements during 2000--2003.<sup>i</sup>

This level of arms imports, however, is only about 35% to 50% of the level of imports necessary to recapitalize and modernize all of its forces. It also helps explain why Iran lacks advanced new C<sup>4</sup>I systems, and has not been able to modernize its air forces, ground based air defenses, or develop major amphibious warfare capabilities. Iran is seeking to compensate in part through domestic military production, but as yet, its present defense industry is not producing either the quality or quantity necessary to solve its problems.

Iran's problems in military modernization have been compounded by a number of factors. The vast majority of the combat-trained manpower Iran developed during the Iran-Iraq War left military service by the mid-1990s. Iran now has a largely conscript force with limited military training and little combat experience. The deep divisions between "moderates" and "hard-liners" in Iran's government inevitably politicized the armed forces, which remain under the command of the supreme religious leader, the Ayatollah Khamenei. Iran retained divided armed forces, split between the regular forces that existed under the Shah, and the Revolutionary Guards created under the Ayatollah Khomeini. This split was compounded by a highly bureaucratic and "stovepiped" command structure, which made limited progress in joint warfare.

Nevertheless, Iran is still a significant conventional military power by Gulf standards. It has some 540,000 men under arms, and over 350,000 reserves. These include 120,000 Iranian Revolutionary Guards trained for land and naval asymmetric warfare. Iran's military also includes holdings of 1,613 main battle tanks, 1,500 other armored fighting vehicles, 3,200 artillery weapons, 306 combat aircraft, 50 attack helicopters, 3 submarines, 59 surface combatants, and 10 amphibious ships.

## **The Iranian Army**

The Iranian Army is large by regional standards. It has some 350,000 men (200,000+ conscripts), organized into four corps, with four armored divisions, six infantry divisions, two commando divisions, an airborne brigade, and other smaller independent formations. These latter units include independent armored, infantry, and commando brigades' six artillery groups, and army aviation units.

Iran has steadily rebuilt its armored strength since the Iran-Iraq War. It has some 1,613 main battle tanks, and the number has risen steadily in recent years. Only part of Iran's tank inventory is fully operational. It is uncertain how many Chieftains and M-47/M-48s are really operational, although its Chieftains include the remainder of 187 improved FV4030/1 versions of the Mark 5 Chieftain that were delivered to Iran before the fall of the Shah. Smaller problems seem to exist in the rest of the force, and some experts estimate that Iran's sustainable *operational* tank strength may be fewer than 1,000 tanks. Furthermore, Iran's Chieftains and M-60s are at least 16-20 years old, and the T-72 and Zulfiqar are Iran's only tanks with advanced fire control systems, sights, and armor-piercing ammunition.

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 515 light tanks and armored infantry fighting vehicles, and 500 APCs. Virtually all estimates indicate, however, that Iran only has about half of the total holdings that it would need to fully mechanize its forces.<sup>ii</sup> This total compares with around 3,000-3,600 such weapons for Saudi Arabia.

Iran has some 865 other armored fighting vehicles (AFVs), of which some 650 are active, including 210 BMP-1s and 400 BMP-2s. This compares with a total of 555 such weapons in 2000, which then included only 140 BMP-2s. Iran appears to retain 70-80 British-supplied Scorpions out of the 250 it received before the fall of the Shah. These are tracked weapons equipped with 76 mm guns. However, the Scorpion is more than 20 years old, and as few as 30 may be fully operational. These problems may explain why Iran has developed a new light tank called the Tosan (Towsan, "Wild Horse," or "Fury") with a 90 mm gun, some of which may now be in service.

Iran is much less well equipped to provide its forces with adequate armored mobility. It has 550-670 armored personnel carriers (APCs). No more than 600 are operational, and most are worn and aging BTR-50 and BTR 60s (300-320), or M-113s (230-250) that are over a quarter of a century old and have not be updated.

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 spread among far too many regular and IRGC units. Iran has only one armored division -- the 92nd Armored Division -- with enough tanks and other armor to be considered a true armored unit.

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 50-75 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 Soviet and Asian versions of the AT-2, AT-3, AT-4, and AT-5. 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 series called the Towsan.

Iran has some 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 82 mm, and 200 M-40 106 mm and B-11 107 mm recoilless guns.

Iran has some 3,000-3,200 operational medium and heavy artillery weapons and multiple rocket launchers, and some 5,000 mortars. Its towed artillery consists largely of effective Soviet designs. Its self-propelled artillery includes 60 2S1 122m weapons, and some Iranian copies. It has some 180 aging M-109 155mm weapons and again is seeking to produce its own weapons as part of the "Thunder" series. It has some 60 aging 170mm, 165mm, and 203mm weapons. Iran also has large numbers of multiple rocket launchers,

including some 700 107mm weapons, 150-200 122mm weapons, 20-odd 240mm weapons, and some 333mm weapons. It manufactures its own multiple rocket launchers, including the long-range Fajr series.

This total is very high by regional standards, and reflects Iran's continuing effort to build up artillery strength that began during the Iran-Iraq War. Iran used artillery to support its infantry and Islamic Revolutionary Guards Corps in their attacks on Iraqi forces. 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. However, Iran's reliance on towed artillery and slow moving multiple rocket launchers limits Iran's combined arms maneuver capabilities, and Iran has failed to develop effective night and beyond-visual-range targeting capability.

Some 2,085 of Iran's weapons are towed tube artillery weapons, versus 310 self-propelled tube weapons, and 700-900 vehicle-mounted or towed multiple rocket launchers. Iran understands that it has less than a quarter of the self-propelled artillery it needs to properly support its present force structure, and that maneuverable artillery is critical to success in dealing with Iraqi and other maneuver forces. It is attempting to compensate for the resulting lack of modern artillery and artillery mobility by replacing its US self-propelled weapons with other self-propelled systems.

Iran's emphasis on massed, static area fire is also indicated by the fact it has 700-900 multiple rocket launchers. It is difficult to estimate Iran's inventory, but its holdings include roughly 10 M-1989 240 mm multiple rocket launchers, 500-700 Chinese Type 63 and Iranian Haseb and Fadjir-1 107 mm multiple rocket launchers, and 100+ Soviet BM-21, Soviet BM-11 122, mm launchers. Iran's land forces operate a number of Iranian-made long-range unguided rockets, including the Shahin 1 and 2, Oghab, and Nazeat. They also include some 10 large 240mm artillery rockets with a range of up to 40-43 kilometers called the Fadjr 3.

Iran has only limited artillery fire control and battle management systems, counter-battery radar capability, and long-range target acquisition capability (although it does have some RPVs) to support its self-propelled weapons. Iran has actively sought more modern fire control and targeting systems since the mid-1980s. It has had some success in deploying and testing RPVs as targeting systems, and has obtained some additional counterbattery radars, but it is unclear how many it obtained or put in service.

Iran continues to deploy surface-to-surface missiles, and has its own systems in development. The number assigned to the army versus the Iranian Revolutionary Guards Corps (IRGC) is unclear, but the IRGC seems to hold and operate most long-range missiles rather than the Army. Iran seems to have some 12-18 Scud B/C launchers and 250-350 missiles, and 30 land-based CSS-8 launchers with 175 missiles. Iran refers to the Scud-B as the Shahab 1 and the Scud C as the Shahab-2.

Iran's new Shahab-3 (Shihab, Sehub) series is a much larger missile that seems to be based on the design of the North Korean No Dong 1 or A and No Dong B missile, which some analysts claim were developed with Iranian financial support. It is based on North Korean designs and technology, but being developed and produced in Iran. This development effort is controlled and operated by the IRGC.

The Shahab-3 may now be in deployment, but possibly only in a “test-bed” unit. Some reports have claimed that the Shahab-3 was operational as early as 1999. Reports surfaced that development of the Shahab-3 was completed in June 2003, and that it underwent “final” tests on July 7, 2003. Discussions of the Shahab-3’s accuracy and reliability are largely speculative. If the system used older guidance technology, and warhead separation methods, its CEP could be anywhere from 1,000-4,000 meters. If it uses newer technology, such as some of the most advanced Chinese technology, it could have a CEP as low as 250-800 meters. In any case, such CEP data are engineering estimates, and missile accuracy and reliability cannot be measured using technical terms like CEP which are based on simulations and models, not tests. Such tests assume the missile can be perfectly targeted at launch and performs perfectly through its final guidance phase, and then somewhat arbitrarily define CEP as the accuracy of 50% of the systems launched. True performance can only be derived from observing reliability under operational conditions, and correlating actual point of impact to a known aim point.

*As is the case with virtually all unclassified estimates of missile performance, the estimates of accuracy and CEP available from public sources are matters of speculation, and no such source has credibility in describing performance in real-world, warfighting terms.* This is not a casual problem, since actual weaponization of a warhead requires extraordinarily sophisticated systems to detonate a warhead at the desired height of burst and to reliably disseminate the munitions or agent. Even the most sophisticated conventional submunitions are little more than area weapons if the missile accuracy and target location has errors in excess of 250-500 meters, and a unitary conventional explosive warhead without terminal guidance is little more than a psychological or terror weapon almost regardless of its CEP.

The same CIA report also reported that the Islamic Republic was developing a ‘Shahab-4’ ballistic missile with a range of 2,000 km and possibly up to 3,000 kilometers with a small warhead. Such a missile could reach targets in Europe and virtually any target in the Middle East. There have also been Israeli reports of an Iranian effort to create a Shahab-5, with a 4,900-5,000 kilometer range. These reports remain uncertain, and Israeli media and official sources have repeatedly exaggerated the nature and speed of Iranian efforts.

The Iranian government stated as early as 1999, that it was developing such a large missile body or launch vehicle for satellite launch purposes, however, and repeatedly denied that it is upgrading the Shahab-3 for military purposes. Iran also continued to claim that the program that the West refers to as ‘Shahab-4’ is a program aimed at developing a booster rocket for launching satellites into space. On January 2004, Iran’s Defense minister claimed that Iran would launch a domestically built satellite within 18 months.<sup>iii</sup>

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. Iran also has 100-180 Bofors L/70 40 mm guns, and moderate numbers of Skyguard 35 mm twin anti-aircraft guns (many of which may not be operational). Its largest holdings consist of unguided ZU-23-2s (which it can manufacture) and M-1939s.

It is unclear how many of these systems are really operational as air defense weapons and most would have to be used to provide very short-range “curtain fire” defense of small point targets. They would not be lethal against a modern aircraft using an air-to-ground missile or laser guided weapon. The only notable exception is the ZSU-23-4 radar guided anti-aircraft gun. Iran has 50-100 fully operational ZSU-23-4s. The weapon is short-ranged, and vulnerable to electronic counter-measures (ECM), but is far more lethal than Iran’s unguided guns.

Iran has large numbers of SA-7 (Strela 2M), and SA-14 (Strela) manportable surface-to-air missiles, and some SA-16s and HN-5/HQ-5 manportable surface-to-air missiles. It had some US-made Stinger manportable surface-to-air missiles it bought from Afghan rebels, but these may no longer be operational or may have been used for reverse engineering purposes. Iran also has some RBS-70 low-level surface-to-air missiles. Iran seems to be producing some version of the SA-7, perhaps with Chinese assistance. It is not clear whether Iran can do this in any large number. Iran’s land-based air defense forces are also acquiring growing numbers of Chinese FM-80s, a Chinese variant of the French-designed Crotale.

Iran pioneered the regional use of army aviation and attack helicopters during the time of the Shah, but built up its holdings of helicopters far more quickly than it expanded its training and maintenance capability. As a result, it had a hollow force at the time the Shah fell. Its inability since that time to obtain adequate spare parts and help in modernizing the aircraft has long made Iranian operational helicopter holdings uncertain.

Iran is also seeking to create a significant RPV force that borrows in many ways from Israeli technical developments and doctrine. It has produced some such RPVs, such as the Mohajer series – and several exercise reports refer to their use. It has sold some of these systems to the Hezbollah, but insufficient data are available to assess this aspect of Iranian capabilities.

Iranian Army communications have improved, as have Iranian battle management and communications exercises. They are now capable of better coordination between branches, the density of communications equipment has improved, and the functional lines of communication and command now place more emphasis on maneuver, quick reaction, and combined arms. However, Iranian battle management and communications capabilities seem to remain relatively limited.

In broad terms, Iran’s Army has improved its organization, doctrine, training, and equipment for land force operations. Iran still, however, is a slow moving force with limited armored maneuver capability and artillery forces better suited to static defense and the use of mass fires than the efficient use of rapidly switched and well-targeted fire. Sustainability is limited, as is field recovery and repair capability. Overall manpower quality is mediocre because of a lack of adequate realistic training and a heavy reliance on conscripts.

The army has some capability for power projection and armored maneuver warfare, but does not train seriously for long-range maneuver and does little training for amphibious warfare or deployment by sea. Its logistics, maintenance, and sustainment system is largely defensive and designed to support Iranian forces in defending Iran from local bases. It does not practice difficult amphibious operations, particularly “across the

beach" operations. It could, however, deploy into Kuwait and cross the border into Iraq. It can also move at least brigade-sized mechanized units across the Gulf by amphibious ship and ferry if it does not meet significant naval and air opposition to any such movement. It lacks the air strength and naval air and missile defense capabilities to be able to defend such an operation.

## **The Islamic Revolutionary Guards Corps (Pasdaran)**

The Iranian Revolutionary Guards add some 120,000 additional men to Iran's forces. Roughly 100,000 are ground forces, including many conscripts. There is a large naval branch, and a small air branch. Estimates of its equipment strength are highly uncertain. The IISS estimates that it has some 470 tanks, 620 APCs, 360 artillery weapons, 40 multiple rocket launchers, and 150 air defense guns, but these estimates are now several years old.

The naval branch has some 20,000 men. According to the IISS, this total includes Iran's marine of some 5,000 men, and a combat strength of one brigade. Other sources show this force subordinated to the Navy. It has at least 40 light patrol boats, 10 Houdong guided missile patrol boats armed with C-802 anti-ship missiles, and a battery of HY-2 Seersucker land-based anti-ship missiles. It has bases in the Gulf, many near key shipping channels and some near the Strait of Hormuz. These include facilities at Al-Farsiyyah, Halul (an oil platform), Sirri, Abu Musa, Bandaer-e Abbas, Khorramshahr, and Larak. It also controls Iran's coastal defense forces, including naval guns and an HY-3 Seersucker land-based anti-ship missile unit deployed in 5-7 sites along the Gulf coast.

These forces can carry out extensive raids against Gulf shipping, carry out regular amphibious exercises with the land branch of the IRGC against objectives like Islands in the Gulf, and could conduct raids against Saudi Arabia or other countries on the Southern Gulf coast. They give Iran a major capability for asymmetric warfare. The Guards also seem to work closely with Iranian intelligence, and to be represented unofficially in some embassies, Iranian businesses and purchasing offices, and other foreign fronts.

IRGC elements do seem to run training camps inside Iran for outside "volunteers." Some 400 IRGC seem to be deployed in Lebanon and actively involved in training and arming the Hezbollah, other anti-Israeli groups, and other elements. The IRGC has been responsible for major arms shipments to the Hezbollah, including large numbers of long-range rockets and some Iranian-made UAVs.<sup>iv</sup> Iran seems to have sent arms to various Palestinian movements, including some shiploads of arms to the Palestinian Authority.<sup>v</sup>

As has been touched upon earlier, the air branch is believed to operate Iran's three Shahab-3 IRBM units, and may have had custody of its chemical weapons and any biological weapons. While the actual operational status of the Shahab-3 remains uncertain, Iran's supreme leader, Ayatollah Ali Khamenei, announced in 2003 that Shahab-3 missiles had been delivered to the Islamic Revolutionary Guards Corps. In addition, six Shahab-3s were displayed in Tehran during a military parade in September 2003.<sup>vi</sup>

It is difficult to estimate the proficiency of IRGC units. It seems likely, however, that they vary 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.

The IRGC would probably be capable of providing an extensive defense capability in the event of any invasion of Iran. They are also light enough so that units could rapidly deploy as “volunteers” to Iraq or any Southern Gulf country where they could obtain local support and access to a seaport or airport. It seems likely that they could move into a country like Iraq in significant force – at least several brigade equivalents and possibly at the division level – if they were invited to do so by some friendly faction. They could also infiltrate in significant numbers. It seems unlikely that the IRGC could deploy and sustain more than a force of several brigades if it were invited into a secure port by some Southern Gulf faction and were not opposed by air and sea. They could certainly mount a significant attack on any island or offshore facility in the Gulf and covertly or overtly introduce large numbers of free floating or bottom mines into any shipping channel.

### *The Quds (Qods) Forces*

The IRGC has a large intelligence operations and unconventional warfare component. 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. This force is under the command of General Ahmad Vahidi (Wahidi), who used to head the information department in the IRGC General Command and had the mission of exporting the revolution.<sup>vii</sup>

The Quds has offices or “sections” in many Iranian embassies, which are closed to most embassy staff. It is not clear whether these are integrated with Iranian intelligence operations, or that the ambassador in such embassies has control of, or detailed knowledge of, operations by the Quds staff. However, there are indications that most operations are coordinated between the IRGC and offices within the Iranian Foreign Ministry and Ministry of Intelligence and Security (MOIS). There are separate operational organizations in Lebanon, Turkey, Pakistan, and several North African countries. There also indications that such elements may have participated in the bombings of the Israeli Embassy in Argentina in 1992, and the Jewish Community Center in Buenos Aires in 1994 -- although Iran has strongly denied this.<sup>viii</sup>

The Quds force seems to control many of Iran's training camps for unconventional warfare, extremists, and terrorists in Iran and countries like the Sudan and Lebanon. It has at least four major training facilities in Iran. The Quds forces has a main training center at Imam Ali University that is based in the Sa'dabad Palace in Northern Tehran. Troops are trained to carry out military and terrorist operations, and are indoctrinated in ideology. There are other training camps in the Qom, Tabriz, and Mashhad governates, and in Lebanon and the Sudan. These include the Al Nasr camp for training Iraqi Shi'ites and Iraqi and Turkish Kurds in northwest Iran, and a camp near Mashhad for training Afghan and Tajik revolutionaries. The Quds seems to help operate the Manzariyah

training center near Qom, which recruits from foreign students in the religious seminary and which seems to have trained some Bahraini extremists. Some foreigners are reported to have received training in demolition and sabotage at an IRGC facility near Isfahan, in airport infiltration at a facilities near Mashad and Shiraz, and in underwater warfare at an IRGC facility at Bandar Abbas.<sup>ix</sup>

### ***The Basij and Other Paramilitary Forces***

The rest of Iran's paramilitary and internal security forces seem to have relatively little warfighting capability. The Basij (Mobilization of the Oppressed) is a popular reserve force of about 90,000 men with an active and reserve strength of up to 300,000 and a mobilization capacity of nearly 1,000,000 men.

Iran also has 45,000-60,000 men in the Ministry of Interior serving as police and border guards, with light utility vehicles, light patrol aircraft (Cessna 185/310 and AB-205 and AB-206s), 90 coastal patrol craft, and 40 harbor patrol craft.

## **The Iranian Navy**

The Iranian Navy has some 18,000 men. According to the IISS, this total includes a two brigade marine force of some 2,600 men and a 2,000-man naval aviation force. It has 3 submarines, 3 frigates, 2 corvettes, 10 missile patrol craft, 7 mine warfare ships, 44 coastal and inshore patrol craft, and 9-10 amphibious ships. Its naval aviation branch is one of the few air elements in any Gulf Navy, and has 5 maritime patrol aircraft, and 19 armed helicopters. When combined with the IRGC naval branch, this is a total maritime strength of 38,000 men with significant capabilities for both regular naval and asymmetric naval warfare.

Iran has given the modernization of its naval forces high priority. Since the end of the Iran-Iraq War, Iran has obtained new anti-ship missiles and missile patrol craft from China, midget submarines from North Korea, submarines from Russia, and modern mines. Iran has expanded the capabilities of the naval branch of the IRGC, acquired additional mine warfare capability, and upgraded some of its older surface ships. Iran's exercises have included a growing number of joint and combined arms exercises with the land forces and air force. Iran has also improved its ports and strengthened its air defenses, while obtaining some logistic and technical support from nations like India and Pakistan. In August 2000, the Islamic Republic announced that it had launched its first domestically-produced light submarine, which is called the Al-Sabiha 15. It can be used for reconnaissance and laying mines.<sup>x</sup>

Iran's ability to compensate for the weaknesses of its surface missiles depends heavily on its ability to use anti-ship missiles to make up for its lack of airpower. Iran's Western-supplied missiles are now all beyond their shelf life and their operational status is uncertain.

Mine warfare, amphibious warfare, anti-ship missiles, and unconventional warfare offer Iran other ways of compensating for the weakness of its conventional air and naval forces. Iran's mine warfare vessels include 2-3 Shahrock-class MSC-292/268 coastal minesweepers (1 used for training in the Caspian Sea). Two of these three ships, the *Shahrock* and *Karkas*, are known to be operational. They are 378-ton sweepers that can be used to lay mines as well as sweep, but their radars and sonars date back to the late

1950s and are obsolete in sweeping and countermeasure activity against modern mines. Iran has 1-2 Cape-class (Riazz-class) 239-ton inshore minesweepers, and seems to have converted two of its Iran Ajar-class LSTs for mine warfare purposes. Many of its small boats and craft can also lay mines. Both the Iranian Navy and the naval branch of the IRGC are expanding their 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 has a range of Soviet, Western, and Iranian-made moored and drifting contact mines, and US experts estimate that Iran has at least 2,000 mines. Iran has significant stocks of anti-ship mines, and has bought Chinese-made and North Korean-made versions of the Soviet mines. It has claimed to be making its own non-magnetic, acoustic, free-floating and remote controlled mines, and has had Chinese assistance in developing the production facilities for such mines. It may have acquired significant stocks of non-magnetic mines, influence mines, and mines with sophisticated timing devices from other countries.<sup>xi</sup>

Iran has significant amphibious assets by Gulf standards, and the regular Navy and naval branch of the IRGC have independent marine forces. These assets are large enough to move a battalion-sized force relatively rapidly, and include: Four Hengam-class (Larak-class) LST amphibious support ships (displacement of 2,940-tons loaded) that can carry up to six tanks, 600 tons of cargo, and 227 troops; and three Iran Hormuz-class (South Korean) LSTs (2,014-tons loaded) that can carry up to 9 tanks and berth 140 troops. They also include 3 Hormuz-21 class 1,80-ton LSTs and 3 Fouque class 176-ton LSLs.

Iran's amphibious ships give it the theoretical capability to deploy about 1,000 troops, and theoretically about 30-40 tanks in an amphibious assault – but Iran has never demonstrated that it has an effective 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 and not on operations using heavy weapons or larger operations. Iran 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 attempted to offset the weakness of its major surface forces by obtaining three Type 877 EKM Kilo-class submarines. Iran's ability to use its submarines to deliver mines and fire long-range wake-homing torpedoes give it a potential capability to strike in ways that make it difficult to detect or attack the submarine. Mines can be laid covertly in critical areas before a conflict, and the mines can be set to activate and de-activate at pre-determined intervals in ways that make mining difficult to detect and sweep. Long-range homing torpedoes can be used against tanker-sized targets at ranges in excess of 10 kilometers, and to attack slow-moving combat ships that are not on alert and/or which lack sonars and countermeasures.

At the same time, many Third World countries have found submarines to be difficult to operate. For example, Russia delivered the first two Kilos with two 120-cell batteries designed for rapid power surges, rather than power over long periods. They proved to last only 1-2 years in warm waters versus 5-7 years for similar batteries from India and the UK. Iran had to turn to India for help in developing batteries that are reliable in the warm waters of the Gulf. Iran has also had problems with the air conditioning in the ships, and their serviceability has been erratic. There are serious questions about crew capability and readiness, and all three submarines already need significant refits.

In any case, the effectiveness of Iran's submarines is likely to depend heavily on the degree of Western involvement in any ASW operation. If the Kilos did not face the US or British ASW forces, the Iranian Kilos could operate in or near the Gulf with considerable impunity. If they did face US and British forces, they might be able to attack a few tankers or conduct some mining efforts, but are unlikely to survive extended combat. This makes the Kilos a weapon that may be more effective in threatening Gulf shipping, or as a remote minelayer, than in naval combat. Certainly, Iran's purchase of the Kilos has already received close attention from the Southern Gulf states and convinced them that they must take Iran more seriously.

Finally, any analysis of the capabilities of the Iranian Navy cannot ignore the fact that Iran's unconventional warfare capabilities include the naval branch of the Islamic Revolutionary Guards Corps which operates Iran's land-based anti-ship missiles and coastal defense artillery. In addition to its land and sea-based anti-ship missile forces, the naval guards can use large numbers of small patrol boats equipped with heavy machine guns, grenade launchers, anti-tank guided weapons, manportable surface-to-air missiles, and 106 mm recoilless rifles.

The IRGC also uses small launches and at least 30 Zodiac rubber dinghies to practice rocket, small arms, and recoilless rifle attacks. Its other small craft were armed with a mix of machine guns, recoilless rifles, and man and crew-portable anti-tank guided missiles. These vessels are difficult to detect by radar in anything but the calmest seas. Iran bases them at a number of offshore islands and oil platforms, and they can strike quickly and with limited warning. The Naval Branch of the IRGC also has naval artillery, divers, and mine-laying units. It had extensive stocks of Scuba equipment, and an underwater combat center at Bandar Abbas.<sup>xiii</sup> Iran is also improving the defenses and port capabilities of its islands in the Gulf, adding covered moorings, more advanced sensors, and better air defenses.

Iran can use IRGC forces to conduct the kind of low-intensity/guerrilla warfare that can only be defeated by direct engagement with land forces, and filter substantial reinforcements into a coastal area on foot or with light vehicles, making such reinforcement difficult to attack. Iran can use virtually any surviving small craft to lay mines and to place unmoored mines in shipping lanes. Its IRGC forces can use small craft to attack offshore facilities and raid coastal targets. Finally, it is important to note the US did not successfully destroy a single land-based Iraqi anti-ship missile launcher during the Gulf War, and the IRGC now has many dispersal launch sites and storage areas over a much longer coast. It also has a growing number of caves, shelters, and small hardened facilities. Such targets are sometimes difficult to detect until they are used, and present

added problems because they usually are too small and too numerous to attack with high cost ordnance until it is clear they have valuable enough contents to merit such an attack.

## **The Iranian Air Force**

The Iranian Air Force has some 52,000 men; 37,000 in the air force per se, and 15,000 in the Air Defense force, which operates Iran's land-based air defenses. It has over 300 combat aircraft in its inventory (The IISS estimates 306). Many of these aircraft, however, are either not operational or cannot be sustained in air combat. This includes 50-60% of Iran's US and French supplied aircraft and some 20-30% of its Russian and Chinese supplied aircraft. It has nine fighter-ground attack squadrons with 162-186 aircraft; seven fighter squadrons, with 70-74 aircraft, a reconnaissance unit with 4-8 aircraft, and a number of transport aircraft, helicopters, and special purpose aircraft. It operates most of Iraq's land-based air defenses, including some 150 IHawks, 45 HQ-21s, 10 SA-5s, 30 Rapiers, and additional forces equipped with light surface-to-air missiles.

As is the case with most aspects of Iranian military forces, estimates differ by source. The IISS estimates the air force has 18 main combat squadrons. Most Iranian squadrons can perform both 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.<sup>xiii</sup>

The IRGC also has some air elements. It is not clear what combat formations exist within the IRGC, but the IRGC may operate Iran's 10 EMB-312 Tucanos.<sup>xiv</sup> It seems to operate many of Iran's 45 PC-7 trainers, as well as some Pakistani-made trainers at a training school near Mushhak, but this school may be run by the regular air force. It has also claimed to manufacture gliders for use in unconventional warfare. The IRGC has not recently expanded its air combat capabilities.<sup>xv</sup>

### ***Iranian Land-based Air Defense***

Iran seems to have assigned about 12,000-15,000 men in its air force to land-based air defense functions, including at least 8,000 regulars and 4,000 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. Total holdings seem to include 30 Improved Hawk fire units (12 battalions/150+ launchers), 45-55 SA-2 and HQ-2J/23 (CSA-1) launchers (Chinese-made equivalents of the SA-2), and possibly 25 SA-6 launchers. The air force also had three Soviet-made long-range SA-5 units with a total of 10-15 launchers -- enough for six sites. Iran has developed and deployed its own domestically manufactured SAM dubbed the Shahab Thaqeb. The SAM requires a four-wheeled trailer for deployment and closely resembles the R440 SAM.<sup>xvi</sup>

Iran's holdings of lighter air defense weapons include 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 holds 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.<sup>xvii</sup> It is not clear which of these lighter air defense weapons were operated by the army, the IRGC, or the air force. The IRGC clearly had larger numbers of manportable surface-to-air launchers, including some Stingers that it had obtained from Afghanistan. It almost certainly had a number of other light air defense guns as well.

air defense forces are 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. 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 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.

#### ***Iranian Air Force Readiness and Effectiveness***

In spite of Iran's efforts, readiness and force quality 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. Iran has a pilot quality problem. Many of its US-trained pilots were purged at some point during the Revolution. Its other US-trained pilots and ground-crew technicians are aging to the point where many should soon retire from service, and have not had advanced air-to-air combat and air attack training for more than 15 years.

Iran is slowly improving its capability for joint land-air, and air-sea operations. Iranian exercises and statements provide strong indications that Iran would like to develop an advanced air defense system, the ability to operate effectively in long-range maritime patrol and attack missions, effective joint warfare capabilities, and strike/attack forces with the ability to penetrate deep into Iraq, the southern Gulf states, and other neighboring powers. Iran's exercises, military literature, and procurement efforts also make it clear that its air planners understand the value of airborne early warning and C<sup>4</sup>I systems, the value of airborne intelligence and electronic warfare platforms, the value of RPVs, and the value of airborne refueling. Iran has even sought to create its own satellite program.<sup>xviii</sup> Further, the air force's efforts at sheltering and dispersal indicate that it understands the vulnerability of modern air facilities and the stand-off attack capabilities of advanced air forces like those of the United States.

## Iranian Proliferation and Weapons of Mass Destruction

Iran has many reasons for acquiring weapons of mass destruction, although it has never openly declared its intentions or admitted to a nuclear weapons program. This makes it impossible to determine Iran's precise motives and intentions, but it seems likely that they include a mix of the following factors:

- A defensive political ruling elite that has survived the Iran-Iraq War, lost the "tanker war" of 1987-1988 to the US, and seen the impact of US conventional superiority in the Gulf War of 1991 and the Iraqi War of 2003.
- US policy-level discussions of regime overthrow in Iran; attacks on Iran for its support of the Hezbollah, Hamas, and other enemies of Israel; and preemptive strikes on Iran's nuclear facilities. President Bush's description of Iran as part of the "axis of evil."
- Iran's problems in modernizing its conventional forces.
- The legacy of the Shah's ambitious efforts to make Iran a major military power and the high probability that he started and maintained a covert nuclear weapons program.
- The legacy of the Iran-Iraq War and Iraq's extensive use of chemical weapons against Iran, plus its use of conventionally armed ballistic missiles against Iranian cities.
- The legacy of the Gulf War, and the lesson that Iraq could use missiles against targets in Saudi Arabia and Israel.
- The broad lesson that weak conventional forces cannot deter or defend against the US.
- The potential threat posed by a hostile Israel, with its own long-range strike systems and nuclear weapons.
- The example set by nations like India, Pakistan, and North Korea.
- The fact that nuclear weapons provide a unique level of military status and prestige, and could potentially make Iran something approaching a regional superpower.
- The potential ability to use long-range missiles and possession of nuclear weapons not only to deter the US and Iran's neighbors, but to intimidate and pressure Iran's neighbors to support its policies and/or to deter interference in limited Iranian military operations in areas like Iraq or the Gulf.
- A belief that Iran must be able to retaliate against any US or regional attack that threatens its regime or the defeat of its conventional forces.

It should be noted that it is impossible to determine what combination of these motives will drive Iran's behavior, and it is dangerous to assume that Iran has fixed plans for proliferation or the use of the forces it develops. Iran faces so much opposition to acquiring such weapons that it is forced to proliferate on a target of opportunity basis, and constantly adapt its approaches to acquiring weapons and delivery systems. Even if it has force plans, it will almost certainly change them over time, and necessarily its doctrine, war plans, and targeting.

It is also extremely dangerous to assume that actual behavior in a war or crisis will occur as if Iran would behave as a perfect "rational bargainer." Iran has not acted aggressively in the past in military terms, and its ruling elite has been cautious in taking risks. History provides warning after warning, however, that behavior can change radically, and take unpredictable risks, in the face of a major crisis. The history of the

West in the 20<sup>th</sup> Century is filled with such examples, and is ample proof that this takes place regardless of nation and culture.

As for Iran's current efforts, the details of its biological warfare efforts are unknown but it continues to import suspect biotechnology. It is also moving forward in the nuclear dimension. The IAEA has discovered a number of disturbing details about its uranium enrichment program that are similar to Libya's nuclear weapons program, including the ability to produce P-2 centrifuges. Iran has conducted experiments with Uranium Hexafluoride that could fuel a weapons oriented enrichment program, and has worked on a heavy water plant that could be used in a reactor design that would produce fissile material far more efficiently than its Russian-supplied light water reactor.

### ***The Status of the Iranian Chemical Weapons Program***

- Iran has pursued chemical weapons since at least the time it first came under Iraqi chemical attack early in the Iran-Iraq War.

Post Iran-Iraq War estimates of Iran chemical weapons production are largely speculative:

- 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.
- On August 2, 2002, the NSC's Director for the Near East indicated that Iran is producing and stockpiling blister, blood, and choking agents.
- The Defense Department's 2001 Report "Proliferation: Threat and Response" suggests that Iran, in addition to producing and stockpiling blister, blood, and choking agents, has weaponized these agents for use with artillery shells, mortars, rockets and bombs. The report also states that Iran is continuing its research into nerve agents.
- 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. Training for Iranian naval forces suggests that they are preparing for the possibility of operating in a contaminated environment.
- Iran has increased chemical defensive and offensive warfare training since 1993.

It seems likely that Iran retains some chemical weapons, and could employ them in combat. It does not, however, overtly train for offensive chemical warfare, and its current and future war fighting capabilities are unknown.

### ***The Status of the Iranian Biological Weapons Program***

Any analysis of Iran's biological weapons effort must be even more speculative. Iran does have extensive laboratory and research capability, and steadily improving

industrial facilities with dual-use production capabilities. Whether it has an active weapons development program, however, is a controversial matter.

The CIA reported in November 2003 that, "Even though Iran is part of the Biological Weapons Convention (BWC), Tehran probably maintained an offensive BW program. Iran continued to seek dual-use biotechnical materials, equipment, and expertise. While such materials had legitimate uses, Iran's biological warfare (BW) program also could have benefited from them. It is likely that Iran has capabilities to produce small quantities of BW agents, but has a limited ability to weaponize them."

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. Iran may have the production technology to make dry storable and aerosol weapons. This would allow it to develop suitable missile warheads, bombs, and covert devices.

### ***The Status of the Iranian Nuclear Program***

Iran has denied that it is developing nuclear weapons since such reports first surfaced in the early 1970s, at the time of the Shah. Since that time, evidence has surfaced again and again that Iran may be lying, and that many of its "peaceful" nuclear activities are actually under the direct or indirect control of the IRGC. However, there has never been conclusive evidence Iran was developing a weapon.

There are also long periods since the fall of the Shah where very little data are available on any aspect of Iran's nuclear efforts, leaving serious gaps in the historical flow of the evidence. Iran has also always claimed to comply with arms control agreements, and has always found an explanation for each new discovery that claims its actions were peaceful and either research programs or efforts to create a national nuclear power program.

The end result is a long list of nuclear programs and facilities that are at best ambiguous in character. Taken as a body of evidence, they provide strong indications that Iran began a nuclear weapons program under the Shah, and that the Ayatollah Khomeini revived this program after Iraq began to use chemical weapons against Iran during the Iran-Iraq War. While Iran has continued to state that it is not developing nuclear weapons, and some of its clerics have said such weapons are against Islamic principles, senior Iranian officials and clerics have also asserted Iran's right to have nuclear weapons and the kind of nuclear fuel cycle that Iran could use to produce weapons grade materials.

### ***Iran's Nuclear Weapons Development Options***

It is far from clear whether Iran will stop its pursuit of nuclear weapons, and it may be only a matter of time before it acquires nuclear weapons. However, it is very unclear what kind of a nuclear power Iran is or will seek to be. No plans have ever surfaced as to the number and type of weapons it is seeking to produce or the nature of its delivery forces.

Iran might be content to simply develop its technology to the point it could rapidly build a nuclear weapon. It might choose to create an undeclared deterrent and limit its weapons numbers and avoid a nuclear test. It might test and create a stockpile, but not openly deploy nuclear-armed missiles or aircraft. It also, however, might create an overt

nuclear force. Each option would lead to a different response for Saudi Arabia and Iran's other neighbors, as well as provoke different responses from Israel and the US -- creating different kinds of arms races, patterns of deterrence, and risks in the process.

As a result, Iran could pursue a wide range of nuclear weapons development options – many of which could be effective even if Iran was subject to many forms of preemptive attack:

- Simply carry out enough ambiguous activity to convince outside nations it has an active nuclear weapons effort, seeking to use the threat of development to create some degree of nuclear ambiguity.
- Carry out a low-level research and development effort that was covert enough to steadily move it towards a break out capability to rapidly create weapons production capabilities, but not actually build production facilities. It could maintain ambiguity by using small redundant efforts, canceling efforts when uncovered, or pausing when acute pressure came from the outside. Developing truly advanced centrifuges or LIS facilities, and completing bomb design and simulation, before beginning development of production facilities are particularly attractive options.
- Covertly develop a highly dispersed set of small and redundant production facilities, combining covert facilities like small “folded centrifuge” operations with sheltered or underground facilities. Slowly acquire actual production capability and begin stockpiling.
- Rely on covert simulation to test bomb designs and their weaponization; test a fractional weapon undergone under the cover of an earthquake, or overtly conduct a surface test as proof of Iran's nuclear capability.
- Appear to cancel most of its ambiguous activities, and wait until its civil nuclear reactor and technology program advances to the point where it is no longer dependent on outside supply, and possibly it can use some of its power reactors to obtain Plutonium. Use compliance with the NNPT to proliferate.
- Deploy its Shahab missiles with conventional warheads, and create a launch on warning/launch under attack capability mixed with sheltering and mobility. Arm the missiles with weapons of mass destruction once this capability is ready. Alternatively, covertly arm some missiles as soon as the Shahab and warheads are ready and/or seek at least limited missile defenses like the SA-400. Combine Shahab forces with air units and sea-based cruise missile units to create survivable and redundant forces. Either announce nuclear capability once a survivable/retaliatory force is in being or rely on nuclear ambiguity.
- Stop at fission weapons, or go on to develop “boosted” and true thermonuclear weapons.
- Stop building up a force at the level of minimal assured deterrence; participate in an open ended arms race, seek “parity” with other regional power like Israel – at least in terms of weapons numbers.
- Rely on an area targeting capability or develop a point target capability as well.
- Deploy satellites to improve targeting, damage assessment, and C<sup>4</sup>I capabilities.
- Develop small weapons, and/or radiological weapons, for possible covert delivery or use by extremist and/or proxy organizations. Use the threat of transfer as a further deterrent, execute strikes in ways where deniability of responsibility has some credibility, or use actual transfer to aid in attacks or for retaliatory purposes.

It is also impossible to dismiss the possibility that Iran could respond to any decision to give up nuclear weapons by developing and producing advanced biological

weapons, or that it may already have biological and nuclear efforts going on in parallel. It might also choose to develop and use "radiological weapons."

Such weapons might take three forms -- all of which would interact with its

### ***Possible Dates for Iran's Acquisition of Nuclear Weapons***

There is no way to estimate when Iran will get nuclear weapons or to be certain that Iran will push its nuclear programs forward to the point where it has actual weapons. In fact, there is a long history of estimates of possible dates that does little more than warn that such estimates are either extremely uncertain or have limited value.

The "wild card" in all these estimates is that the deadlines would change so radically if Iran could buy fissile material from another nation or source -- such as the 500 kilograms of fissile material the US airlifted out of Kazakhstan in 1994. This was enough material to make up to 25 nuclear weapons, and the US acted primarily because Iran was actively seeking to buy such material.<sup>xix</sup> If Iran could obtain weapons grade material, a number of experts believe that it could probably develop a gun or simple implosion nuclear weapon in nine to 36 months.

### ***Iran's Nuclear Warfighting Doctrine and Capabilities***

Little meaningful data are available on Iranian nuclear doctrine and targeting -- to the extent current plans would even be relevant in the future. Iran's nuclear efforts will also interactive heavily with the progress Iran makes in biological and chemical weapons programs and its efforts to improve its delivery capabilities. By the time Iran has significant nuclear capability, it may have significant missile, cruise missile, and long-range strike aircraft capability -- although it may not have cruise missiles capable of carrying a nuclear weapon. It may also have rebuilt much of its conventional capabilities to the point where it has significant warfighting capabilities.

What is clear is that if Iran acquired a working nuclear device, this would suddenly and radically change perceptions of the military balance in the region. Iran is likely to acquire such weapons at about the same time it acquires MRBMs, and this would be a volatile combination. Iran could then destroy any hardened target, area target, or city within the range of its delivery systems. Iran's Southern Gulf neighbors are extremely vulnerable to attacks on a few cities, and even one successful nuclear attack might force a fundamental restructuring of their politics and/or economy. They are effectively "one bomb" countries. The same is true of Israel, although it has limited missile defenses and is steadily improving them, and could launch a massive retaliatory nuclear armed missile strike against virtually all of Iran's cities.

Iranian nuclear capabilities would raise major mid-term and long-term challenges to Saudi Arabia, the other Southern Gulf states, Iraq, Israel, and to the West in terms of deterrence, defense, retaliation, and arms control. Iran can almost certainly continue to disguise most of the necessary research and development effort to go own developing improved enrichment and weapons design and manufacture technology regardless of the limits placed upon it by IAEA inspection and its agreements with Europe. These could include the ballistic testing of weapons and warheads with the same weight, size, and balance as real weapons, and the use of complex simulation and testing with nuclear

weapons designs that are workable in every respect except that they substitute material with lower levels of enrichment for Pu-239 or highly enriched Uranium.

There is the possibility that Iran's efforts could lead to US and Israeli preemption against Iran's developing nuclear weapons production facilities if either country felt confident that it could destroy them with conventional weapons, and that there was an urgent need to do so. This, however, presents serious problems for the US and Israel. Iran has extensive numbers of known nuclear facilities and is a large country that could conceal many more.

Even if a preemptive strike was initially successful, Iran could continue its efforts by placing them in many dispersed small and redundant facilities, and/or putting them deep underground. Even P-2 centrifuge enrichment facilities can be deployed in small chains that can be "folded" to fit in virtually any building, and made redundant by having multiple small chains and moving steadily more enriched material from one building to another.

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<sup>i</sup> Richard F. Grimmett, Conventional Arms Transfer to Developing Nations, 1996-2000, Washington, Congressional Research Service, CRS RL32547, August 26, 2004, pp. 50 and 61.

<sup>ii</sup> The estimates of Iran's AFV and APC strength are based on interviews with Israeli, British and US civilian experts, and the IISS, Military Balance, "Iran"; Jane's Sentinel: The Gulf States, "Iran."

<sup>iii</sup> Jane's Missiles and Rockets, "Iran Enhances Existing Weaponry by Optimising Shahab-3 Ballistic Missile", January 20, 2004.

<sup>iv</sup> Amir Taheir, "The Mullah's Playground," Wall Street Journal, December 7, 2004, p. A10.

<sup>v</sup> The estimates of such holdings of rockets are now in the thousands, but the numbers are very uncertain. Dollar estimates of what are significant arms shipments are little more than analytic rubbish, based on cost methods that border on the absurd, but significant shipments are known to have taken place.

<sup>vi</sup> Jane's Missiles and Rockets, "Iran Enhances Existing Weaponry by Optimising Shahab-3 Ballistic Missile", January 20, 2004.

<sup>vii</sup> . 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.

<sup>viii</sup> New York Times, May 17, 1998, p. A-15; Washington Times, May 17, 1998, p. A-13; Washington Post, May 21, 1998, p. A-29.

<sup>ix</sup> A J Venter, "Iran Still Exporting Terrorism," Jane's Intelligence Review, November, 1997, pp. 511-516.

<sup>x</sup> Jane's, "Iran", 29 October 2001.

<sup>xi</sup> Washington Times, March 27, 1996, p. A-1.

<sup>xii</sup> In addition to the sources listed at the start of this section, these assessments are based on various interviews, prior editions of the IISS Military Balance; the Jaffee Center Middle East Military Balance, Jane's Sentinel: The Gulf States, "Iran;" and Jane's Defense Weekly, July 11, 1987, p. 15.

<sup>xiii</sup> Wall Street Journal, February 10, 1995, p. 19; Washington Times, February 10, 1995, p. A-19.

<sup>xiv</sup> Reports that the IRGC is operating F-7 fighters do not seem to be correct.

<sup>xv</sup> Reuters, June 12, 1996, 17:33.

<sup>xvi</sup> Jane's Defence Weekly, "Iran Reveals Shahab Thaqeb SAM Details," September 4, 2002, <http://jdw.janes.com>, Accessed Januray 9, 2004. Labeled 44.

<sup>xvii</sup> 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, 1997-1998, "Iran"; Jane's Sentinel: The Gulf States, 1997, "Iran;" USNI Data Base; Anoushiravan Ehteshami, "Iran's National Strategy," International Defense Review, 4/1994, pp. 29-37; Military Technology, World Defense Almanac: The Balance of Military Power, Vol. XVII, Issue 1-1993, ISSN 0722-3226, pp. 139-142; and working data from the Jaffee Center for Strategic Studies; Dr. Andrew Rathmell, "Iran's Rearmament: How Great a Threat?," Jane's Intelligence Review, July, 1994, pp. 317-322; 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; and Anoushiravan Enreshami, "Iran Strives to Regain Military Might," International Defense Review, 7/1996, pp. 22-26.

<sup>xviii</sup> Jane's Defense Weekly, September 4, 1996, p. 4.

<sup>xix</sup> New York Times, May 14, 1995; Washington Post, November 5, 1997, p. A-1.