

**PROJECT ON NUCLEAR ISSUES SPRING CONFERENCE  
NEVADA SUPPORT FACILITY  
LAS VEGAS, NEVADA  
APRIL 4 – 6, 2011**

**PRESENTATION ABSTRACTS**

**SESSION ONE: FUTURE SCENARIOS FOR NUCLEAR STRATEGISTS AND POLICYMAKERS**

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**The Threat that Leaves Something to Chance in U.S.-China Relations**

*Vincent Manzo, Research Assistant, Institute for National Strategic Studies, National Defense University*

The risks of nuclear escalation, in Jan van Tol's study of an AirSea Battle, do not invalidate the AirSea Battle concept. Effective deterrence requires that the United States develop credible non-nuclear responses to China's emerging A2/AD posture. Yet this preliminary analysis suggests that deterrence and nuclear deterrence are not always distinct: a non-nuclear U.S. response to Chinese A2/AD attacks would create a heightened risk of escalation and nuclear war that both countries could influence but neither could control. This dynamic should strengthen U.S. deterrence of Chinese conventional, counter-space, and cyber attacks. However, U.S. officials must persuade China of the escalatory risks described above. Influencing Chinese perceptions of the consequences of conventional, counter-space, and cyber attacks is a core challenge to building a stable deterrence relationship with China. My presentation will explore how the United States might do this.

**Then and Now: Australian perspectives on Extended Nuclear Deterrence**

*Ms. Christine Leah, Doctoral Candidate, Strategic and Defence Studies Centre, Australian National University*

Since the signing of the ANZUS Treaty in 1951, Australia has been a 'beneficiary' of U.S. Extended [Nuclear] Deterrence. Over ensuing decades, the credibility of that security guarantee has waxed and waned with different schools of thought in the Australian policy community and until the early 1970s, policymakers sought to equip Australia with its own nuclear weapons. But the late 1960s ushered in an era of strategic and nuclear order in Australia's strategic environment which gave much greater credibility to U.S. assurances. That framework was characterized by relative peace in the Asia-Pacific, no direct threats to the Australian continent, a limited number of nuclear weapon states, and a relatively stable deterrence relationship between the two 'responsible' and systemic great powers, the U.S. and USSR. In that context, nuclear peace was indivisible and the security of the U.S and Australia was symbiotic. But that order might be changing: there are important geopolitical shifts taking place towards and within Asia. Strategic geography is contracting because of proliferation in long-range missiles, Asian powers rising *at the same time*, and increasing nuclear latency. In the future, such

changes could easily reawaken some enduring debates in Australia about U.S security guarantees, and Australia's own nuclear identity.

### **Tracking a Nuclear al Qaeda**

*Kristen Hajduk, Research Associate, Institute for Defense Analyses*

Before al Qaeda can employ a nuclear weapon, it will decide to acquire a nuclear device and then spend time and resources planning and executing a specific series of actions that end with a nuclear detonation. This presentation will demonstrate this dynamic through a decision-action framework in the form of a representative timeline. Each time phase has decision points and internal actions that likely emit external indicators detectable by outside observers. These decision points, internal actions, and external indicators will be paired with corresponding U.S. responses to deter or disrupt future al Qaeda actions. Depending on the decision point, there might be multiple subsequent internal actions. Likewise, each internal action might have multiple external indicators. Finally, there might be multiple U.S. responses to a single external indicator or a single response to several indicators. The presentation will begin with an examination of the literature on the principles of decision-making within terrorist organizations. The presentation will then leverage existing case studies to create assumptions about the actions expected to occur when al Qaeda pursues, acquires, prepares and employs a nuclear weapon. The case studies include the 1993 World Trade Center Bombings, the 1998 Embassy Bombings in Kenya and Tanzania, the 9/11 World Trade Center and Pentagon Attacks, the 7/7/2005 Bombings in London, and the 12/25/2009 attempted Airplane Bombing. The literature review and case studies will illustrate various decision points, internal actions, and external indicators that may reoccur. Should an outside actor – like the United States – observe these external indicators, it can apply an array of responses that could deter or disrupt al Qaeda's plans. Together, these correlated actions will be placed upon a timeline according to the four time phases of the framework.

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## **SESSION TWO: FUTURE NUCLEAR REQUIREMENTS AND CAPABILITIES**

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### **Qualitative Considerations of Nuclear Forces for Future Arms Control Negotiations**

*Tom Devine, Policy Analyst, SAIC and Rebecca Gibbons, PhD Candidate, Georgetown University*

The presentation will be on our year-long study which examines the qualitative characteristics of nuclear weapons and the relative value of these characteristics as nuclear forces are reduced. In trying to discern the most important characteristics of our force at lower numbers we are considering both the deterrence mission and conflict scenarios against a spectrum of types of adversaries. We also consider what characteristics are most important for assuring allies.

**Increasing the Scope of Targets: Requirements and a Proposed Solution**

*Drake Warren, Senior Member, Technical Staff, Sandia National Laboratories*

As the size of the U.S. stockpile decreases it will be desirable to maintain a flexible second strike capability in order to maintain a credible deterrence of an adversary's first strike. Consideration of a wider range of targets beyond military targets would increase flexibility and could facilitate reductions in the stockpile. This presentation will outline the requirements of a targeting strategy that is credible and effective and proposes a new strategy, "commercial targeting," that may meet these requirements.

**Are Conventional Weapons a Viable Option for Damage Limitation Operations against Medium-sized Nuclear-armed Adversaries?**

*Tong Zhao, Ph.D. Candidate, Sum Nunn School of International Affairs, Georgia Tech University*

The ability to control escalation and reduce damage in conflicts with nuclear adversaries has been an important component of American military strategy. The option of preemptive use of nuclear weapons, however, became increasingly unpopular in recent years – it is morally indefensible and militarily impracticable. As a result, the ability to conduct conventional preemptive strikes as a means of damage limitation against nuclear-armed adversaries looks increasingly attractive to military strategists. On a number of recent occasions, the scenario of using conventional counterforce strikes in damage limitation operations against nuclear adversaries has been used to justify the development and deployment of U.S. conventional global strike systems which raises concerns in China and some other nuclear-armed countries. However, the feasibility and wisdom of conventional counterforce strike has not been tested by rigorous research. In the context of a hypothetical U.S.-China conflict in Asia-Pacific region, existing studies mistook the scenario of a preemptive strike against China by assuming that the U.S. will focus on and target China's intercontinental ballistic missiles (ICBM). This presentation points out that contrary to previous analysis, if the U.S. ever considers a first strike for the purpose of escalation control, it is more likely to target China's theater nuclear forces rather than ICBMs. Accordingly, this presentation illustrates a comprehensive analysis on the probability that American conventional strikes might destroy China's theater nuclear forces which include DF-3A, DF-4, DF-21, DF-31 missiles, Type 094 nuclear submarines, and nuclear-capable H-6 bombers. The presentation concludes that using conventional global strike capabilities against medium-sized nuclear adversaries for purpose of damage limitation is impracticable and problematic and will mostly likely lead to inadvertent escalation. The presentation offers a number of policy recommendations to help mitigate potential negative impact of the development of conventional global strike capabilities on strategic stability between nuclear-armed rivals.

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**SESSION THREE: VERIFICATION AND DETECTION CHALLENGES**

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**The Challenges of Verifiable Nuclear Warhead Dismantlement***Guy Earle, Defence Staff, British Embassy*

The UK remains committed to the long term goal of a world without nuclear weapons. To realize the goal there must be a period in which the global nuclear stockpile is smaller than at present and more evenly spread between the Nuclear Weapon States. Consequently, verification demands will increase and governments will require a greater level of transparency from one another. The recently ratified New Strategic Arms Reduction Treaty limits the number of deployed nuclear warheads and contains stringent verification measures to ensure compliance. Future treaties may limit the total stockpile size and could require warhead dismantlement to reach compliance. Ultimately, verified warhead dismantlement will form an essential part of fulfilling multilateral disarmament obligations under Article VI of the NPT. Although table top exercises will be cheaper and can produce valuable results, they cannot replicate the tensions of a real inspection and identify unforeseen problems. Nuclear weapons dismantlement processes, and their verification, are complex and there remain many unresolved challenges. However, there is no reason to believe that these challenges cannot be overcome through focused international cooperation on multilateral exercises.

**Managed Access: Addressing the Technical Problems Associated with Verifying Actual Warhead Reductions***Foy Hubert, Center for Accelerator-based Research and High Energy Physics, Department of Engineering, University of Oslo, Norway*

Article VI of the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT) requires all states parties to pursue good-faith negotiations on effective measures, inter alia, on a treaty on general and complete disarmament “under strict and effective international control”. In this context, arms reductions efforts should include Nuclear Weapon States and Non-Nuclear Weapon States and cover warhead dismantlement and on-site inspection verification measures. On-site inspection is a particular important measure to monitor and verify states’ compliance under an agreed warhead dismantlement protocol. More so, the method can help to build international confidence in the dismantlement process. The method requires inspectors to access areas and compartments in sensitive facilities in order to observe, conduct measurements, analyze data, and report on the effectiveness of the dismantlement. This method has been a major issue in virtually all arms control negotiations because it is associated with operational, technical, classification, safety and security problems. These challenges entail increasingly difficult political and technical negotiating decisions, which include the level of inspector intrusion and inspector abilities to meet dismantlement expectations with good enough confidence. Research and testing of dismantlement technologies is an important element for any future inspection regime.

**Verification Challenges at Low Numbers**

*Paul Booker, Mechanical Engineer, Pacific Northwest National Laboratory and Jacob Benz, Nuclear Engineer, Pacific Northwest National Laboratory*

President Obama announced in Prague that the reduction and ultimate elimination of nuclear weapons is a goal of the United States. This presentation will consider the arms control verification challenges associated with reducing stockpiles from 1,000 to 100 and ultimately 10 nuclear weapons per state.

**The Challenge of Knowledge Transfer among Key Technical Areas and between Generations**

*Brian Ticknor, Senior Scientist, Savannah River National Laboratory*

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**SESSION FOUR: EXPANDING THE REACH OF NONPROLIFERATION AND NUCLEAR SECURITY EFFORTS**

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**Strengthening the IAEA: the Double Track**

*Sonia Drobysz, Ph.D. candidate, Panthéon Sorbonne University; Junior Associate Researcher, Center for International Security and Arms Control Studies*

Calling for wider application of the IAEA safeguards system and extended cooperation to ensure its implementation while insisting on the need to constantly strengthen its effectiveness and improve its efficiency, the last NPT review conference underlined that the verification tool of the non-proliferation regime is neither universal nor fully optimized. The IAEA's general conference itself recently called on its own member States to 'give their full and continuing support to the Agency in order to ensure that [it] is able to meet its safeguards responsibilities'. The international community's concern, or at least part of it, was also well expressed in the International commission on nuclear non-proliferation and disarmament report, which states that 'the IAEA, while the bulwark of the safeguards system, has been insufficiently resourced, both in terms of authority and capabilities, to detect clandestine nuclear activities, and a number of serious violations have slipped through the net in recent years, giving both weapon and non-weapon states cause for concern about the foundations of the NPT bargain they signed up to'. Insisting on the importance to preserve and promote the institutional legitimacy of the IAEA within a regime which is often described as being in crisis, the presentation will explore a few aspects of a double track approach aiming to ensure better achievement of safeguards objectives and ultimately, non-proliferation ones.

**Paths and Limitations to Universalizing the Additional Protocol**

*Sarah Poe, M.A. Candidate, Monterey Institute for International Studies*

In 1997, to supplement its traditional Comprehensive Safeguards Agreements (CSAs), the International Atomic Energy Agency (IAEA) introduced the 'Additional Protocol' or Informational Circular 540, in response to the discovery of Iraq's clandestine nuclear weapons program. The failure to discover Iraq's program demonstrated the inability of the IAEA to identify the diversion of nuclear material using CSAs alone. This revised, voluntary agreement between states and the IAEA was to become the new safeguards standard for states to implement. However, the AP has so far failed to meet such expectations. Since 1997, only 104 of 151 IAEA member states have implemented the agreement, with a number of those outstanding being states of more serious proliferation concern. This presentation seeks to explore the particular linkages which continue to prevent holdout states from ratifying the additional agreement, assuming that these particular requests will be considered when responded to with specific policy decisions. In doing so, this presentation will analyze the paths that have led states to either implement – or refuse – the Additional Protocol and identify potential tools to encourage holdout states to ratify.

#### **Implementation of 2010 Nuclear Security Summit Commitments**

*Rob Golan-Vilella, Scoville Fellow, Arms Control Association*

Over the past several months, I (along with two colleagues at other organizations) have been working to monitor the implementation of the national commitments made at the Washington summit. We are working on a report scheduled to be released in April 2011, around a year after the summit. The report will essentially consist of a "status update" regarding how the countries are doing with their commitments – what has been achieved and what has not. Our principal bottom-line conclusion is that nations are generally doing what they committed to do in Washington. Over 60% of the commitments have already been met, and countries have made significant progress towards completing many of the other ones. On very few of them has there been no progress at all. Moreover, some of the commitments that are currently "in progress" are deliberately designed to take more than a year or two – one example is Canada's commitment to return its American-origin highly enriched uranium, which is supposed to happen "between 2010 and 2018." My presentation chiefly consists of our findings for the report. Finally, will close by looking beyond the findings of our report.

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#### **SESSION FIVE: NEW APPROACHES TO NORTH KOREA AND IRAN**

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#### **Megatons to Megawatts: A New Energy Policy in North Korea**

*John K. Yi, Master of Arts Candidate, Center for Eurasia, Russia and Eastern European Studies, Georgetown University*

The "Megatons to Megawatts" Program has been an incredibly successful US-Russia partnership that seeks to convert bomb-grade uranium from Russian warheads into low enriched uranium for US civilian nuclear power plants. What makes this multinational effort

unique, within the scope of non-proliferation, is that it is actively converting what was formerly part of a nuclear weapons regime into a part of a civilian energy regime. I argue that the concept of such a conversion can serve as a crucial part of the Six Party Talk negotiations with North Korea. So far within the Six Party Talks, meeting North Korea's energy need and coercing it to dismantle its weapons program have always been tied together. However, I argue that the goal of creating an energy sufficient North Korea should remain separate from discussions on Pyongyang's nuclear weapons ambitions. Instead a singular effort should be made solely on providing North Korea with the option of converting its nuclear weapons facilities and infrastructure into civilian energy. Thus, by assuring first an energy independent North Korea through a sort of "Megatons to Megawatts" Program, we can then pave a more hopeful path to future negotiations in the complete dismantling of North Korea's nuclear weapons program.

**Non-proliferation Policy in the Media-Dominated Political Environment: the Iranian Case**

*Margarita Zolotova, United Nations Office of High Representative for Disarmament Affairs*

The main focus of the presentation is an examination of the role media plays in the public political discourse regarding the U.S. strategy towards Iran and its nuclear activities, and how the government's response to the 24/7 communication cycle might shape the evolution of official policy. This media-policy interplay is especially vibrant during U.S. election cycles where sound bites and pronouncements in the media may often replace conventional channels of diplomacy and formal negotiation. The presentation poses the question to what extent may Washington's position on nonproliferation strategy be dependent on a reaction to a constant and relentless news streamline, forcing U.S. leaders to adopt political positions without the benefit of lengthy consultation and thorough reflection.