PONI 2010 SPRING CONFERENCE
APRIL 8 – 9, 2010

PRESENTATION ABSTRACTS

SESSION 1: THE FUTURE OF THE NPT AND THE NONPROLIFERATION REGIME

Restoring the NPT

Deepti Choubey, Carnegie Endowment for International Peace

With growing fears about Iran and North Korea's nuclear programs, conventional wisdom holds that the nonproliferation regime is on the verge of collapse. The upcoming 2010 Non-Proliferation Treaty (NPT) Review Conference is an opportunity to strengthen the regime, but it is in danger of being overloaded by expectations. This presentation's aim is to put the Review Conference in context, talk about what's at stake for President Obama's Prague agenda, discuss steps that nuclear weapons states and non-nuclear weapons states can take to achieve success and avert catastrophic failures, and identify key developments to watch for in May and after the conference.

Nuclear Proliferation and Non-State Actors: Fashioning a New Regime

Sanhita Ambast, Joint Degree Student, MALD (Fletcher School of Law and Diplomacy, Tufts University) and LLM (Harvard Law School, Harvard University)

This presentation is concerned with one crucial issue facing the non-proliferation regime today: addressing the growing role of non-state actors in the field of nuclear proliferation. Over the last few decades, non-state actors have grown in importance and impact. While there has been resistance to the overt inclusion of these actors in the field of arms control – seen for long as the exclusive domain of the nation-state – recent developments and the failure of the NPT are strong reasons to move away from this paradigm. The notion that non-state actors should be made a part of the global architecture of the non-proliferation process is not new, and many noted scholars argue that their exclusion is a critical failure of the NPT. This presentation creates a three-part typology of non-state actors relevant to the non-proliferation regime today: organisations that *demand* nuclear technology; groups that intentionally or unwittingly *supply* nuclear technology; and NGOs that have played crucial roles in the evolution of the non-proliferation regime. This paper will seek to address the emergence of each of these categories of non-state actors in the context of the global non-proliferation regime.

Nuclear Renaissance: addressing the challenges of Nuclear Power Capacities Expansion

Natalia V. Saraeva, Graduate student, Edmund A. Walsh school of Foreign Service, Georgetown Universit

Accompanying what many are calling a new nuclear renaissance are risks posed by the spread of nuclear power plants, especially in countries that have never had nuclear generation capacities before. The French Nuclear Safety Authority has already raised this issue in 2008 saying that they will "be selective about providing assistance" in countries that had never before had experienced with nuclear power. Globalization of nuclear technology and concerns over safety and security create a need for universal standards of nuclear power plant construction, operation, and decommission. One of the options to reduce the risks associated with the spread of nuclear power plants, especially in developing countries with unstable political systems, is to create an international center for nuclear power, possibly under IAEA supervision or within the structure of the IAEA. To this end, this presentation will seek to address

possible responsibilities for such a center vis-à-vis standardization and supervising the spread of nuclear power.

Can the UK continue to demonstrate its disarmament and non-proliferation credentials having committed to Continuous at Sea Deterrence?
Gareth Stevens, Nuclear and Strategic Deterrent Office, British Defence Staff – United States, British Embassy, Washington DC

This proposal will assess how the UK's road to zero and non-proliferation commitments fit with the committed, submarine based, Continuous at Sea Deterrence posture. It will begin by discussing the evolution of UK nuclear policy and posture since the end of the Cold War and the UK's standpoint/commitment to fissile material security, nuclear counter-terrorism, non-proliferation and disarmament. Then, it will move on to discuss the UK's commitment to the road to zero and its belief that global nuclear disarmament is intrinsically linked to creating the right conditions in an uncertain future to provide the necessary level of confidence in giving up the cornerstone of its national security policy.

SESSION 2: ARMS CONTROL AND NONPROLIFERATION IN SOUTH ASIA

Towards a new arms control agenda in South Asia
Sébastien Miraglia, Norwegian Institute for Defense Studies, Department of Civil-Military relations, Research fellow, nuclear policy, arms control and military technology

Following the Indian and Pakistani nuclear tests of 1998, a large number of arms control initiatives have been proposed to reduce the risk of a nuclear conflict in South Asia. Assuming that nuclear weapons may decrease regional stability, academics and policy makers have devoted time and efforts to persuade India and Pakistan to abandon the development of their nuclear programmes. However, after twelve years of arms control proposals in South Asia, little has been achieved. This presentation seeks to understand the failure of arms control initiatives by looking at the constraints of previous and current proposals. More precisely, it will offer a critical assessment of the current arms control agenda in the region by reflecting on the following questions: What key issues are addressed by arms controllers and how do they relate to the security concerns expressed by India and Pakistan? How does this relationship influence the aversion towards proposed arms control regimes? Finally, what key issues might be included in future arms control proposals to make them more implementable and contribute to the stabilization of regional security dynamics?

U.S. Leadership in Addressing the Non-Proliferation Challenge in South Asia
Rizwan Ladha, MA Candidate, The Fletcher School of Law and Diplomacy, Tufts University

There is currently a critical need for US leadership to promote global cohesion and multilateral dialogue as nuclear-armed India and Pakistan continue to work towards a de-escalation of hostilities in the wake of the Mumbai attacks of November 26, 2008. Because the particular role of the United States is paramount to achieving long-term and sustainable peace in South Asia, the current US policy posture towards India and Pakistan's nuclear programs is unfortunately overwhelmingly myopic. If not rectified immediately, Washington's policies will prove in the long run detrimental to the overall progress towards South Asian non-proliferation and conflict resolution. To address three key challenges – non-adherence to existing nonproliferation frameworks, recently heightened tensions, and broader security implications beyond India and Pakistan – this proposal provides policy recommendations for the Obama administration to effectively mitigate South Asian hostilities and alleviate global nuclear tensions.

Engaging the Scientific Enclave in India towards Nonproliferation post Indo-US Civilian Nuclear Agreement
Saurabh Dutta Chowdhury, Masters Candidate in Nonproliferation and Terrorism Monterey Institute of International Studies

Following its 1974 nuclear test, India increasingly turned to indigenously developed nuclear technology due to export controls on technology from Canada and the U.S. This indigenous effort was led by a scientific enclave that pioneered civilian and military programs, using common platforms in many cases. Until now, not much thought has been placed on how to bring the Indian scientific enclave onboard. This situation is risky from a proliferation standpoint as, all of a sudden, a powerful group with nuclear knowhow has been rendered powerless. This proposal seeks to address potential proliferation risks brought on by the US-India nuclear deal by engaging India's nuclear community through Global Threat Reduction initiatives, encouraging peaceful, commercial applications of the enclave's knowhow, and fostering exchanges with U.S. think tanks and academia.

Punishing Proliferators: The A.Q. Khan Network and Legal Obstacles to Prosecuting Nuclear Traffickers
Philip Johnson, Senior Research Fellow and M.A. Candidate, Georgetown University Department of Government

The illicit transfer of nuclear weapons technologies and materials to non-nuclear weapons states and non-state actors has become a billion-dollar black market industry and poses an inestimable threat to international peace and security. The common thread connecting the world's most notorious proliferators, including North Korea and Iran, is the critical assistance their nuclear weapons programs have received from organized proliferation networks, such as the transnational nuclear smuggling operation organized by Pakistani scientist A.Q. Khan. Identifying nuclear smugglers is only half the battle to arrest nuclear proliferation. Many known proliferators have been arrested around the world and brought to trial on multiple occasions only to have international and domestic legal obstacles frustrate prosecution attempts. This presentation examines the cases of five Khan network affiliates in Germany, the UK, the Netherlands, and South Africa, identifies the common legal hurdles prosecutors faced in these cases, and suggests new domestic and international legal frameworks and avenues of cooperation to ensure the successful prosecution of nuclear traffickers.

SESSION 3: ARMS CONTROL AND NONPROLIFERATION IN EAST ASIA

Nuclear Factor in Sino-Russian Relations: Implications for the United States
Nikita Perfilyev, Monterey Institute of International Studies

Nuclear arms reductions beyond the START follow-on negotiations will have to take into account developments of the Chinese nuclear arsenal. While experts in the United States are concerned about the future of the Sino-American relations and consider scenarios of China challenging the US, China will be in a position to challenge Russia's interests much sooner those of the United States if Russia is not able to balance it. This presentation will briefly review the state of strategic relations between the two countries,

analyze the range of Russian views on rising China, and assess the implications for U.S. nuclear policy and bilateral and multilateral arms control.

China's Nuclear Declaratory Policy and Operation Strategy
Tong Zhao, Doctoral Student, Sam Nunn School of International Affairs, Georgia Institute of Technology

Great attention has been paid to study the development strategies of major nuclear weapons states – the concrete arrangements on the quality and quantity of nuclear weapons and the course and pace of their development. As a result, positive interaction between nuclear powers was seen in past decades in terms of numerical reduction in nuclear stockpiles. Less progress has been made, however, in areas such as de-alerting nuclear forces and reducing the role of nuclear weapons in a country's overall national defense. This presentation examines the consistency between China's declaratory policy and practical operation of its nuclear force in order to examine the effects of states' nuclear operational strategies on the risk of nuclear war and attempts to design a roadmap toward a nuclear free world.

North Korean Proliferation Risks after Kim Jong Il: Assessing Future Scenarios
Sico van der Meer, Netherlands Institute of International Relations

This presentation will focus on the proliferation risks of North Korean nuclear weapons technology when the country's dictator, Kim Jong Il, will die. Kim is suffering from health problems and his passing away may have serious consequences for the stability of the North Korean regime – and thus for the proliferation risks of the nuclear technology that is available in the country. Several scenarios exist on what will happen with the regime when Kim Jong Il will pass away, varying from a smooth succession of Kim by his youngest son, to a struggle for power with anarchy and chaos as a result. If the regime implodes, both a unilateral intervention by China and a multilateral intervention by South Korea, the United States, and other countries, are possible. All these scenarios have implications for the risk of nuclear weapons proliferation to other states and to non-state actors. This presentation will assess the risks and opportunities of some of the most probable future scenarios.

Nonproliferation Challenges in East Asia: Development of Strategic Trade Controls
Dr. Togzhan Kassenova, Senior Research Associate, Center for International Trade and Security

The countries of East Asia express general support for nonproliferation treaties. However, there remains a lack of interest among these countries in participating in the established multilateral export control regimes. In general, the countries of the region make laudable efforts to establish effective export control systems as required by UN Security Council Resolution 1540. However, for some of them, insufficient resources significantly hamper export control development. In recent years, East Asian countries have demonstrated cooperation on issues pertaining to strategic trade management and border security, including intelligence-sharing. Importantly, there remains a dangerous divide between the economically advanced countries and those with more limited resources in terms of effective strategic trade control systems. Even those countries in the region with more developed strategic trade control systems still lack more advanced controls on technology transfers and brokering activities, which are standard components of robust control systems. The presentation will provide an overview of key regional trends in terms of strategic trade controls, highlight achievements and challenges faced by the countries in East Asia.

SESSION 4: TECHNICAL TALK – DEVELOPING AND MAINTAINING WEAPON DESIGN EXPERTISE IN A COMPREHENSIVE TEST BAN TREATY ERA

Developing and Maintaining Weapon Design Expertise in a Comprehensive Test Ban Era

James Cooley, X-4 Division, Los Alamos National Laboratory
The lack of clear national mission focus and declining budgets, along with the unclear long term commitment to the nuclear enterprise, is hindering the training and retention of high quality scientists necessary for future deterrence. This paper will discuss how the nuclear weapon design community is working to train future designers in a post-CTBT environment and compare this effort to the method used during the testing era. I will emphasize the importance of human judgement compared to the computational modelling capability provided by the science based stockpile stewardship program and discuss areas that need improvement to better train and validate the designer human judgment. I will also identify areas which could be improved to encourage young scientists to choose a career in nuclear weapon design.

SESSION 5: REFINING APPROACHES TO NUCLEAR STRATEGY AND DETERRENCE

Understanding Saddam's Non-Use of WMD in the Gulf War
David Palkki, Institute for Defense Analyses

Ever since the Gulf War, scholars have debated why Iraq did not use chemical or biological weapons against Coalition forces or US allies. Many analysts have suggested that Saddam didn't use WMD because the ferocity of the Coalition onslaught, adverse weather, difficulties mating toxic materials with warheads, or other factors rendered Iraq physically unable to deliver them. Others argue that US Secretary of State James Baker's ambiguous warning that the United States would retaliate with nuclear weapon strikes, and/or by replacing Saddam's regime, deterred Iraqi use. I find that Iraq was physically able to attack Coalition forces and US allies with chemical and biological weapons, yet refrained from doing so for fear of US nuclear retaliation. Deterrence, however, was largely existential, as Saddam considered US nuclear strikes plausible long before US officials issued even the most veiled of threats. My argument is based on captured recordings of private conversations between Saddam and his inner circle, declassified US interrogation reports, defector accounts, and recently released memoirs. My findings have important implications for the ongoing debate over the role of the US nuclear arsenal and the question of a US no-first use declaratory policy.

Nuclear deterrence theory transformation in the XXI century: the Middle East case study
Polina Sinovets, National Strategic Studies Institute, Department of the Middle East and Black Sea Studies, Odesa Branch

This presentation will analyse classic deterrence theory through the lens of modern Iran-Israeli relations. Considering the risks of a nuclear-armed Iran becoming reality in the near future, this analysis will also consider a scenario involving a nuclear Iran. This case may prove to be the litmus test for deterrence theory transformation in the 21st century. Regarding this system in the framework of virtual models of interaction, we will go through a number of pre-deterrence and deterrence models. The analysis of the scenarios introduced in this research will sum up the effects of an emerging nuclear state in the Middle East. Meanwhile, the present course of events gives us the possibility to regard Iran as the potential challenger of the non-proliferation regime. Taking into consideration the rivalry between Iran and the nuclear Israel, this presentation will seek to clarify the effectiveness of various deterrence scenarios and the effects of U.S. involvement in the region.

European Missile Defense and the future of NATO burden sharing
Thomas Young, Research Associate, James Martin Center for Nonproliferation Studies, Monterey Institute of International Studies

It is widely acknowledged that U.S. nonstrategic nuclear weapons (NSNW) currently deployed in Europe have no operational utility. Instead, they perform a political role that highlights the United States' commitment to the defense of Europe, while at the same time facilitating burden sharing through a range of allied contributions to the nuclear mission. This presentation proposes that the political/symbolic role that is currently being performed by NSNW could also be carried out by the reconfigured European MD architecture, a system that would also have operational utility surpassing currently-deployed NSNW.

Balancing Assets and Liabilities: US Primacy and the Strategic Utility of Missile Defense
Michael Mayer, Visiting Fellow, CSIS, Doctoral Fellow, Norwegian Institute for Defence Studies
The marriage of nuclear weapons and ballistic missiles produces an instrument of political persuasion more than a usable military asset. Ballistic missile defenses therefore must be viewed in terms of their political and strategic impacts, not simply in military terms of defending the US from attack. Deployments and further development of BMD assets must continue to take into account possible and probable strategic and political effects – and opportunity costs – of deployment. To minimize these costs, the US should find the most advantageous balance of capabilities, including between theater and national defenses, and levels of deployed assets in various regions.

SESSION 6: TECHNICAL METHODS FOR NUCLEAR MATERIAL DETECTION AND ANALYSIS

Nuclear Smuggling and the International Technical Working Group
Richard Hagar, Policy Analyst, Domestic Nuclear Detection Office, Department of Homeland Security

The Nuclear Smuggling International Technical Working Group (ITWG) was formed in 1996 under the guidance of the G-8 Non-Proliferation Experts Group in response to international concerns over reported incidents of illicit nuclear trafficking. It is open to any state, or representatives of that state, interested in nuclear forensics, with each state funding its own participation. This presentation seeks to highlight the importance of the ITWG and its contributions to international nuclear security, how its informal nature provides it a greater degree of freedom in assisting and discussing forensics, aids it offering support to individual countries, and provides the personal foundation for future formal agreements.

Cosmic ray muon scattering tomography for security applications
Lindsay Cox, Atomic Weapons Establishment

Cosmic ray Muon Scattering Tomography (MST) is an innovative technique that uses naturally occurring background radiation to detect the presence of high Z material. MST works by measuring the trajectories of muons as they enter and leave an object. Those muons passing through high density material will tend to scatter through greater angles, allowing the distribution of material within the object to be inferred from determinations of many scattered muon tracks. Advantages of this technique include the passive nature of cosmic ray muons, the amount of material the highly penetrating muons can traverse and the ability of the tomographic reconstruction to produce an image, or density profile, of the item of interest. As such, this presentation proposes and discusses applications of MST in the areas of homeland security (e.g., cargo scanning), treaty verification, and nuclear fuel storage (e.g., material security).

Ultra-High Resolution Alpha Spectrometers
Alexander Plionis, Senior Scientist, Remote Sensing Laboratory, Andrews AFB

Forensic Analysis and Data Interpretation

Theodore Nichols, Post-doctoral Fellow, Savannah River National Laboratory

The Nuclear Forensics Analysis Center (NFAC) is part of Savannah River National Laboratory (SRNL) and is one of only two USG National Laboratories accredited to perform nuclear forensic analyses to the requirements of ISO 17025. SRNL NFAC is capable of analyzing nuclear and radiological samples from bulk material to ultra-trace samples. NFAC provides analytical support to the FBI's Radiological Evidence Examination Facility (REEF), which is located within SRNL. REEF gives the FBI the capability to perform traditional forensics on material that is radiological and/or is contaminated. SRNL is engaged in research and development efforts to improve the USG technical nuclear forensics capabilities. Research includes improving predictive signatures and developing a database containing comparative samples.