



Terrorism, Transnational Crime and Corruption Center

**What is Needed?
The Way Ahead for WMD Policy**

**Conference Report
16 April 2009**



School of Public Policy

The Terrorism, Transnational Crime and Corruption Center (TraCCC) at George Mason University's School of Public Policy held a day-long conference on April 16th, 2009 to address the major priorities in WMD Policy. The conference assembled a unique group of experts, representing governmental agencies, academia, investigative journalism, law enforcement, independent researchers, and the corporate world. Drawing on this diverse expertise, the conference examined the problems of WMD proliferation, nuclear smuggling, the nexus of criminals and terrorists, and the new opportunities for international engagement with the Obama Administration. This report summarizes the conference proceedings, which were open but not for attribution.

Key Observations

- The nature of the WMD threat varies. Biological and nuclear proliferations pose different challenges and require distinctive strategies.
- Crime-terror networks are real. Failure to understand the nature, purpose, and evolving form of the links between criminal and terrorist organizations will lead policymakers to underestimate the threat.
- U.S. policy relies too heavily on technical means to combat nuclear smuggling. Case-based and field research uncovers unique operational insights from those directly involved in combating nuclear smuggling and contributes significantly to counter-WMD efforts.
- Nuclear smuggling does not follow a distinct route but travels the same routes as drugs and other illicit commodities.
- Stovepipes and a lack of coordination among agencies are hindering the effectiveness of U.S. policies.
- Additional efforts are needed to determine how to address the post-proliferation environment in which strategic nuclear materials were obtained by unauthorized individuals before they were locked at the source.

Addressing the Problem

Following just days after President Obama's April 5, 2009 speech in Prague, Czech Republic on nuclear disarmament, the conference began with a clear understanding of the criticality and timeliness of the topic. As President Obama expressed, "we must act with a sense of purpose without delay."

The conference opened appropriately by first assessing the problem. What is the nature of the WMD problem we face today and what is the impact on WMD policy? While many specific issues were raised as being particularly problematic, two key characteristics weaved through them all. First, the conference agreed that the WMD challenges we face today are transnational in nature. While our policies may focus on nation states, the threats we face are not confined by borders.

Organized crime networks have smuggled nuclear materials thousands of miles across borders; cyber attacks on critical infrastructure have originated from locations halfway across the globe; and domestic enemies have mailed biological pathogens to national leaders. Additional threats emanate from weak states unable to control their borders, from the cooperation of terrorists and criminal organizations across borders, and from the challenges associated with implementing and coordinating policies among the 192 sovereign states. The conference recognized the transnational nature of WMD threats as fundamental and agreed that policies to effectively counter such threats must be similarly transnational. We must respect but re-examine the concept of territorial integrity in this new world.

The second characteristic of today's WMD challenges relates to the unruly nature of the threat. While the conference was not overly pessimistic regarding the prospects of countering the proliferation of WMD, members of the conference did identify several threats that were either *uncontrollable* or at least *uncontrolled* thus far. The conference publicly recognized that an unknown quantity of fissile material went astray following the Cold War and called for increased efforts to ascertain the size of the potential black market for strategic nuclear materials. Samples of highly enriched uranium (HEU) intercepted throughout Europe offer evidence that at least a portion of this material in active circulation is weapons-grade. Yet detection rates are low and the policy community remains ignorant as to the true extent to the strategic material that was "lost" in the aftermath of the Cold War.

Whereas securing HEU and plutonium will go a long way towards managing the threat of nuclear weapons, no such comfort exists with biological agents. There are no technical “chokepoints” even in theory. Unlike fissile materials, biological pathogens are living material that can replicate and highly dangerous pathogens are endemic in many parts of the world. This also means that accurate inventories, an important part of controlling fissile materials, are of only limited value for biological materials. Knowing who has what strains in what collections is important, but attempting to track quantities makes little sense.

Furthermore, while HEU and plutonium are costly and relatively difficult to produce, pathogens are cheaply and easily produced. They are present at a wide variety of facilities around the world, with some two dozen pathogens considered potential biological warfare agents. A number of toxins, in particular ricin, have a history of use and the prospect of synthetic biology, which would permit the construction of biological agents by assembling pieces of DNA, holds out the specter of artificially constructed lethal pathogens.

Lastly, although HEU and plutonium have a relatively limited number of nonmilitary applications, biological agents have a wide range of important and legitimate applications in research in the pharmaceutical and biotechnology industries. The wide and legal availability of biological pathogens make biological collections and laboratories that hold already refined strains a tempting target for terrorists and criminals. While naturally occurring mutations of biological pathogens may be an even worse or immediate threat than that which could be produced by terrorists, many of the measures to address disease through improved public health would also fortunately increase preparedness to bioterror attacks.

Our policies must address these transnational, seemingly unmanageable elements of WMD. We must first recognize differences in the threats, particularly the dissimilarity between the nuclear and biological threat. As we move forward on WMD policy, we must seek to balance our mechanisms, institutions, and programs to meet both the nature and the diversity of the threats we face today.

The Crime-Terror Nexus

The conference also examined the link between crime and terrorism. The speakers offered a unique on-the-ground perspective to dealing with the threat of nuclear smuggling and insights into the operational challenges of implementing WMD policy in the field. There was wide agreement that the link between crime and terror is real. Further, a past investigation of an al-Qaeda cell in a NATO partner state revealed the readiness of al-Qaeda operatives to mount a radiological attack, reiterating the urgency to address the crime-terror nexus.

The conference emphasized that networked criminal organizations -- distinct from hierarchical or mafia-style organized crime -- are central to nuclear smuggling. These networks control the transnational logistical and transport nodes and thus play a key role in moving a variety of smuggled goods, including drugs, humans, stolen vehicles, and HEU.

Notions that HEU or fissile material would follow separate smuggling routes due to uniqueness or perceived higher value were dismissed by the conference as flawed. Nuclear materials do not follow a distinct route from that travelled by drugs and other illicit commodities. Indeed, an operational expert from an allied nation indicated that heroin routes from Afghanistan to destination nations throughout Europe overlap with HEU smuggling routes from the former Soviet republics. Furthermore, law enforcement agencies discovered nuclear materials in Europe using drugs informants and other undercover measures used to find illicit substances such as drugs.

Unfortunately, however, these smuggling routes cross thousands of miles and elements of these networked criminal organizations often lack information on other parts of the logistical chain. By using established routes -- such as the ancient Silk Road routes -- and reliable means of transport, the networks operate seamlessly despite a lack of detailed or comprehensive knowledge of the entire route.

The conference also emphasized that we must focus on where the links between terrorists and criminals originate. Prisons were identified as an area of particular concern as low level terrorists often travelling on false documents are arrested for petty theft and other low level crime are imprisoned alongside local smugglers -- forming new alliances in the process. Interactions between terrorists and criminals also form in regions

outside state control, Diaspora communities such as those that exist in Madrid and Hamburg, and states where leadership is self-interested or corrupt. Conflict regions are also a particular concern. Field investigations of the Oleg Khinsagov case in Georgia that uncovered 100 grams of weapons grade HEU, identified the transit region of South Ossetia as “a smuggler’s paradise.” However the conference also recognized other regions with limited governance, such as exist in many parts of Latin America and Africa, as regions of potential concern.

A key question that arose in discussing the crime-terror nexus was whether the right tools and techniques were in place to adequately address the problem. The consensus was unanimous; they are not.

The conference indicated that there was an over-reliance on technology to “solve” the problem of nuclear smuggling. Instead of treating technology as one of many tools to combat WMD proliferation, it is too often used as both the first and the only means of detection. Evidence from extensive field research highlighted significant problems with relying on detection capabilities alone.

The conference acknowledged the impact of widespread bribery, corruption, and the absence of a security culture in the regions where nuclear smuggling occurs. Also, investigations into the Khinsagov case were used to illustrate the near-irrelevance of technology to smugglers. Khinsagov reportedly said he knew where the detectors were placed and simply avoided routes through such locations.

Basic infrastructure to support detection equipment is also critical. The South Ossetian border village where the 100 grams of HEU crossed into Georgia provided an illustration of this challenge. The first generation detector would trip offline during frequent local power outages [3-4 times daily]. This required the border guards to hike up a hill slope to manually re-start the detector. During field interviews, the border patrol admitted to rarely doing this, leaving the detector as nothing more than expensive decoration.

Not only were the right tools lacking, but the speakers at the conference expressed the belief that we are not basing our analysis of the nuclear smuggling threat on the right data. WMD policy regarding nuclear smuggling too often relies on databases which contain only a partial view of

nuclear smuggling incidents or armchair analyses instead of qualitative research and contextual data from the field, particularly from the experts who have detected and investigated cases of nuclear smuggling. Consequently, analysts lack an understanding of how smugglers operate, how police agencies intercept nuclear materials, and how crime-terror networks interact. Analysts must also learn more about destination countries, map smuggling routes, understand how policies are implemented in the field, and recognize the extent to which installed equipment is operational or capable of detecting actual incidents of weapons grade nuclear smuggling.

The conference emphasized the need to break down stovepipes between programs and agencies. Separating policies and programs into counterterrorism, counternarcotics, counterintelligence, and counter-organized crime creates structural flaws, reinforces faulty assumptions, and creates gaps in our ability to counter WMD proliferation. We need to embrace interdisciplinary approaches and enhance critical thinking skills from the early stages of national security training.

One critical area of expertise the conference felt was underutilized was the police. Evidence presented at the conference from the successful interdiction of nuclear material in Europe and the former Soviet republics supports the need for increased use of intelligence-led policing, regional analytical work, undercover operations, information sharing, and anti-corruption programs.

Opportunities for Engagement

Finally, the conference examined opportunities for international engagement and expansion of the approach to WMD under the Obama Administration. In order to gain insight into the areas in need of improvement, the conference first examined what has already been done in terms of WMD response, reviewing the policies and programs that form a layered defense from site security in source nations to emergency response capabilities in the U.S. following a WMD attack.

This programmatic perspective offered insights into which areas have a significant number of programs in place but need additional coordination and which areas lack robust programs. For example, there are a substantial number of programs and policies in place to secure fissile material at the

source and a lesser number that attempt to interdict nuclear material at foreign borders. However, only a handful of programs exist to interdict material in transit, confirming earlier discussions by conference members on the need to bolster efforts to combat nuclear smuggling.

Similarly, while a large number of programs focus on detection at U.S. points of entry and WMD attack response, few programs address the movement of nuclear materials within domestic boundaries. Interdicting materials in transit [domestically or internationally] appears to have received little programmatic attention, with the conference wondering whether we have perhaps locked the barn door after the horses have escaped.

In general, the conference felt that efforts to tackle WMD problems have been responsive to a known problem, not proactive. Yet the conference acknowledged that efforts have also been entrepreneurial. Where there has been a gap, people have worked creatively to fix or solve the problem. While notable, this has unfortunately resulted in coordination challenges as multiple “solutions” to the gaps exist, with little to no overall management and significant redundancy within and among programs. The U.S. needs to proactively resolve these coordination problems and do so soon.

Despite many challenges with the programs already in place, the conference agreed that using existing mechanisms and institutions is preferable to “re-inventing the wheel” in most cases. This is not to say that the conference did not offer new ideas on ways to move towards a more effective WMD policy.

Policy Recommendations

Throughout the day of discussions, the conference offered a variety of practical recommendations for policymakers, practitioners, and academic researchers. With such diverse expertise in the conference, it was impossible for participants to have been unanimous on all aspects of what needed to be done. The following recommendations reflect a variety of opportunities to act upon without delay.

Policy

- We should conduct a comprehensive risk assessment to prioritize WMD policy. While recognizing the importance of protecting soft targets such as chemical or industrial plants, the conference felt the growing trend to label too broad a range of issues as critical to national security was harmful to effective WMD policy and potentially dangerous to our scientific and economic development.
- We should re-balance WMD policy – both in terms of threat and countermeasures. Programs and policies in place to counter nuclear proliferation are often inappropriate to counter the biological threat. Further, programs that rely too heavily on one countermeasure, such as technology, are too narrow in scope to be effective.
- We should avoid activity distinctions and accompanying programmatic stovepipes. We must encourage better coordination among analysts working counternarcotics, counterterrorism, counterintelligence, counter organized crime, and regional analysis. Policies and budgets must reflect the reality that these areas are not distinct, but rather overlap in several dimensions. We must not let ongoing debates over differing intents and capabilities of each group drive analysis.
- We should re-tool Cold War strategies of deterrence for application to today's globalized world. We should deter leakage of WMD by denying terrorists access to source material. We should consider moving U.S. declaratory policy further in this direction to enhance international norms against WMD proliferation. The conference acknowledged that the Westphalian system of nation states, while degraded by a variety of non-state actors and transnational threats, currently remains central to the international political system. However, the conference also recognized that state-based policies have limits.

- We should increase efforts to promote detection and cooperation in detecting material that left nuclear facilities before being locked at the source. In order to effectively address this problem of proliferation in a post-proliferation environment, we cannot place too much dependence on technology and monitors to stop the spread of this material.
- We should consider consolidating entry level education and training across different agencies to facilitate a more comprehensive and holistic conception of national security.
- We should develop distinctive strategies to counter the smuggling of nuclear and biological materials in order to customize our policies to meet real differences in the nature of the threat.
- We should focus additional efforts on tracking the expertise required for the weaponization of biological pathogens. Given the wide and legal availability of dual-use biological materials, a stronger emphasis on the requisite expertise can improve efforts to contain the biological threat.
- We should closely examine the applicability of treaties and conventions as well as economic policies to advances in the life sciences. Research in this field is an increasingly global enterprise, often used to jumpstart economic development, and is quickly outpacing the institutions in place to control biological threats.
- We should engage the scientific community and make a concerted effort to explain reasonable security concerns related to proliferation of biological agents. The conference recognizes that it is a paradigm shift for scientists to consider security implications of their research and encourages improved dialogue between the policy and life science communities.
- We should resolve coordination gaps between federal, state, and local responses to WMD and consider establishing a governmental office dedicated to this mission. We need to

focus on eliminating duplicative efforts and coordinating programs among the different branches of the U.S. government and our allies.

Research

- We should increase efforts to conduct qualitative field research on a variety of aspects of WMD. Analyses of the success and failures of WMD policies must include data obtained from on-the-ground research as well as insights obtained through successful investigations.
- We should conduct more research that addresses the complex nature of criminal and terrorist networks in different regions and globally. Due to the inherent flexibility and adaptability of criminal and terrorist networks, we need to continually conduct this research and adjust our findings as appropriate to understand this threat.
- We should reevaluate the validity of the conclusions of previously conducted analyses which have relied on limited databases and have failed to incorporate important operational and contextual insights needed to understand the realities of nuclear smuggling.
- We should revisit the concept of national sovereignty in the globalized world and generate ideas on how to adjust state-based programs and policies to meet transnational threats and consider when borders should not be inviolate.
- We should increase efforts to determine how best to contain strategic nuclear material not locked at the source. We need to focus more effort on addressing the post-proliferation environment in which materials were obtained by unauthorized individuals before being locked at the source.

International cooperation

- We should re-emphasize nuclear arms reductions such as those in START I and II and encourage other non proliferation regimes and treaties such as Nuclear Free Zones that strengthen international norms of nonproliferation and non-use of WMD. The conference recognized that combating WMD is a normative challenge and that continued efforts at arms reduction is critical to the strength of existing nonproliferation institutions.
- We should establish or enhance intelligence sharing among law enforcement agencies in different parts of the world and engage in regional training on intelligence-led policing to combat WMD. The conference acknowledged that we must better harness and share the expertise within law enforcement agencies to effectively curb WMD proliferation.
- We should develop policies that address the entire fuel cycle, including monitoring new nuclear reactors and dealing with spent nuclear fuel. We need additional information and understanding about the market-driven proposals to expand commercial nuclear reactors for electrical power in order to inform police and other law enforcement entities about the potential threats from illicit actors.
- We should re-examine international regimes and controls on all elements of WMD policy, including arms reduction. We should also re-examine privacy laws, universal jurisdictions and evidentiary problems that arise from transnational threats.
- We should develop international and regional policies and programs to curb the education and training of the next generation of terrorists.
- We should encourage the development of specific laws against WMD smuggling across the globe. The conference recognized the criticality of such laws to law enforcement efforts.

- We should encourage the development anti-corruption policies and a culture of security across the international community as a means of curbing systemic graft in police, border patrol, and other agencies that play a critical role in combating WMD proliferation.
- We should employ all elements of statecraft to engage nations throughout the Middle East on the threat of WMD proliferation. This should include negotiations, military-to-military technical assistance, incentives, efforts to improve civil society, and other diplomatic efforts to enhance dialogue. We must not rely on punitive military action alone.

In summary, the conference brought together policy makers, practitioners, and academics in a neutral and open forum to an effort to improve the policy process. We believe that the diverse group of experts assembled for the conference, as well as the active participation of the audience, offered a valuable exchange of ideas that contributed to a critical discussion of what is needed for WMD policy.

TraCCC wishes to thank Ploughshares Fund for its initial support to TraCCC for its research on nuclear smuggling, the School of Public Policy for hosting the event, and the moderators, panelists, audience and staff that donated their time and expertise to making the conference possible.

If you have any questions or comments for TraCCC, please email us at tracc@gmu.edu, call (703) 993-9757, or visit our website at <http://policy-tracc.gmu.edu>.

Note: The Chatham House Rule applied to the conference. This report reflects the Rappateur's impressions of the conference. No participant is in any way committed to its content or expression.

Panelist Biographies

Professor Yonah Alexander is currently a Senior Fellow at the Potomac Institute for Policy Studies and Director of its International Center for Terrorism Studies as well as a member of the Board of Regents. Concurrently, he is Director of the Inter-University Center for Terrorism Studies and Co-Director of the Inter-University Center for Legal Studies. In addition, Professor Alexander is the former Director of Terrorism Studies at The George Washington University and the State University of New York, totaling 35 years of service. He is a member of the International Institute of Strategic Studies (London).

Educated at Columbia University (Ph.D.), the University of Chicago (M.A.), and Roosevelt University of Chicago (B.A), Dr. Alexander is founder and editor-in-chief of *TerrorismCentral.com* and the *International Journal on Minorities and Group Rights*. He also founded and edited *Terrorism: An International Journal and Political Communication and Persuasion: An International Journal*. He has published over 90 books on the subjects of international affairs and terrorism. He serves as editor-in-chief of a series of books on terrorism for Martinus Nijhoff (The Netherlands), coeditor of *Terrorism: Documents of International and Local Control* (Oceana Publications, New York), and editor, *Terrorism Library, Transnational Publications* (New York). Professor Alexander has appeared on many television and radio programs in over 40 countries. His numerous articles and interviews have been published in both the United States and the international press.

M.E. (Spike) Bowman, J.D./LL.M is a specialist in national security law and policy. Most recently he served as Deputy, National Counterintelligence Executive. He has been a Senior Research Fellow at the National Defense University and, upon retiring from the Navy served for more than a decade in the Senior Executive Service of the FBI as Senior Counsel, National Security Law and as Director, Intelligence Issues Group, setting up the National Security Branch of the Bureau. As a naval officer he served as the Chief of Litigation, as a diplomat at the U.S. Embassy, Rome, and as Head of International Law at the Naval War College. He has been an integral player in the prosecutions of a large number of espionage and terrorism cases from 1983 to the present. Captain Bowman is a member of the ABA Standing Committee on Law and National Security, is Chairman of the Board of the Association for Intelligence Officers and is a Distinguished Fellow, University of Virginia School of Law.

Michael Bronner is a freelance writer and reporter covering issues of security, culture and international affairs. He has published recently in *Vanity Fair*, *The New York Times* and with Harvard's Belfer Center for Science and International Affairs. Bronner is also a filmmaker, serving as a creative associate producer on the Oscar-nominated feature *United 93* about the 9/11 attack, and currently as co-producer of *Green Zone*, an upcoming feature set in Iraq in early 2003 dealing with the futile search for WMD after the invasion.

Prior to recent work in print and film, Bronner spent many years exploring similar subject matter as a producer at CBS News/60 Minutes, where he shared in a Peabody Award for coverage of the HIV/AIDS pandemic in Africa. He lives in New York City.

Mahmut Cengiz is a Major in the Turkish National Police where he has received many service awards. He previously served at the Anti-Smuggling and Organized Crime Department for twelve years. There, he worked in fields pertaining to mafia-type organized crime, nuclear smuggling, arms smuggling, as well as the Turkish Witness Protection and Undercover Unit. From 1998-2003, he served as Chief, Organized Crime Section, Nuclear Materials Smuggling. He also served in the Kosovo Peacekeeping Mission for one year.

Currently, he is a PhD student at George Mason University's School of Public Policy. He holds two master's degrees, one from Kirikkale University and another from the School of International Service at American University. He received his PhD in Sociology from Ankara University. His Turkish dissertation was titled, *How Corruption Becomes Entrenched in the Public Bureaucracy*. He has conducted extensive research on organized crime and corruption in Turkey and has authored two books: *Turkish Organized Crime Groups* and *How the Mafia is Explained by Conflict Theory*." He has several published articles on organized crime and corruption.

Christopher A. Corpora is the President and CEO of Capitol Innovation and Strategy Solutions, LLC serving as a Contract Senior Advisor to the Federal Bureau of Investigations. He is currently an Adjunct Professor at George Mason University's School of Public Policy. Dr. Corpora is a nontraditional security threats specialist with a focus on transnational organized crime and its role in the broader global context. He is a career national security professional with nearly 20 years of military, civilian government and private sector experience. Dr. Corpora has published dozens of scholarly essays, articles and book chapters and is an active Senior Fellow in several research and policy institutes, focused on nontraditional security threats. He received his Ph.D. from American University's School of International Service in 2005 and is currently working on a monograph addressing local perceptions of and attitudes toward organized crime and corruption in Bosnia and Herzegovina and Afghanistan.

Alex Gliksman is principal of Science, Strategies and Solutions LLC. Mr. Gliksman has played a central role in the development of advanced analytic tools, and surveillance, mission planning and operational support systems for the Armed Services and US Intelligence. He has served on the senior staffs of the House Intelligence Committee and Senate Foreign Relations Committee. He also has extensive experience in defense and technology assessments across South Asia and the Pacific Rim.

From 1991 to 1993, he served on the professional staff of the House Intelligence Committee, where he was responsible for oversight and evaluation of intelligence support to military operations, counterproliferation and arms control activities. From 1982 to 1985, he directed the Senate Foreign Relations Committee Arms Control Subcommittee staff.

Mr. Gliksman has published and lectured widely. His writings have appeared in the opinion pages of the New York Times, Washington Post, Los Angeles Times, International Herald Tribune, USA Today, Baltimore Sun, Christian Science Monitor, among others, numerous academic journals including Foreign Policy, and he contributed chapters to over a dozen books. He served as a Contributing Editor of National Defense magazine. He has lectured in 15 countries and appeared on National Public Radio, CNN and the BBC. He edited two volumes on technology for peacekeeping operations, the first under the auspices of the Congressional Office of Technology Assessment and the second for Lawrence Livermore National Laboratory.

Alex Gliksman has taught on the graduate faculty of the University of Southern California and at the University of Maryland. He studied at New York University, the University of Vienna, and pursued doctoral studies in international relations at University College London.

Jo L. Husbands is a Scholar/Senior Project Director with the Board on Life Sciences of the U.S. National Academies. Dr. Husbands managed the project that produced the 2004 report, *Biotechnology Research in an Age of Terrorism*, and directs the international activities following up on its recommendations, including the 2nd International Forum on Biosecurity held in Budapest in March 2008 and an international workshop on biosecurity education to be held in the fall of 2009. She represents the National Academy of Sciences on the Biosecurity Working Group of the InterAcademy Panel on International Issues, which also includes the academies of China, Cuba, the Netherlands (chair), Nigeria, and the United Kingdom.

From 2005-2008 Dr. Husbands was a senior project director with the Academies' Program on Development, Security, and Cooperation where, along with her work on international security, she was staff director for a USAID-sponsored report, *Improving Democracy Assistance: Building Knowledge through Evaluations and Research* (2008). From 1991-2005 she was the Director of the Committee on International Security and Arms Control (CISAC) of the National Academy of Sciences and its Working Group on Biological Weapons Control. In 1998-99 she also served as the first Director of the Program on Development, Security, and Cooperation in the Academies' Office of International Affairs.

Dr. Husbands is currently an adjunct professor in the Security Studies Program at Georgetown University, where she teaches a course on the International Arms Trade. She is a member of the Advisory Council of Women in International Security, the International Institute for Strategic Studies, and the Global Agenda Council on Illicit Trade of the World Economic Forum. She is also a Fellow of the International Union of Pure and Applied Chemistry. She holds a Ph.D. in Political Science from the University of Minnesota and a Masters in International Public Policy (International Economics) from the Johns Hopkins University School of Advanced International Studies.

Dr. Rensselaer Lee is a leading U.S. authority on international crime and narcotics, and nuclear security issues. A Stanford PhD, he is President of Global Advisory Services, a

McLean, VA-based consulting firm, and concurrently a Senior Fellow at the Foreign Policy Research Institute in Philadelphia. He is the author of *The White Labyrinth: Cocaine and Political Power* and *The Andean Cocaine Industry* (with Patrick Clawson) and *Smuggling Armageddon: the Nuclear Black Market in the Former Soviet Union and Europe*. His articles and commentaries have appeared in *Foreign Policy*, *Foreign Affairs*, *Orbis*, *Parameters*, *Global Crime* and other journals.

Dr. Lee has performed overseas contract assignments for the State Department, the Department of Energy, the World Bank, the White House Office of National Drug Control Policy and other agencies, which have encompassed Russia, Eastern Europe, Central Asia, the Caribbean, China and Andean South America. During 2002-2003, he worked as a research analyst at the Congressional Research Service of the Library of Congress, where he produced major reports on the Office of Homeland Security, terrorist finance, nuclear smuggling and Afghanistan's opium-heroin trade. In January 2009, he was a short term scholar-in-residence at the Kennan Institute for Advanced Russian Studies in Washington. Dr. Lee speaks Russian, Chinese, Spanish and French.

Robert Litwak is Director of International Security Studies at the Woodrow Wilson International Center for Scholars in Washington. He is also an Adjunct Professor at Georgetown University's School of Foreign Service and a Consultant to the Los Alamos National Laboratory. Dr. Litwak served on the National Security Council staff as Director for Nonproliferation in the first Clinton administration. His most recent books are: *Rogue States and U.S. Foreign Policy: Containment after the Cold War* and *Regime Change: U.S. Strategy through the Prism of 9/11*.

Dr. Litwak has held visiting fellowships at Harvard University's Center for International Affairs, the International Institute for Strategic Studies, the Russian Academy of Sciences, Oxford University, and the United States Institute of Peace. He is a member of the Council on Foreign Relations, and received a doctorate in international relations from the London School of Economics.

Judy Mandel is a Consultant for International Business Development in the Washington Defense Division of URS Corporation. She served for 28 years as a Foreign Service Officer, whose tours of duty included include the U.S. Embassy in London, the Department of State's European Bureau and the Bureau of Politico-Military Affairs, as well as two tours at the U.S. Embassy in Moscow, where she was the Deputy Political Counselor. Ms. Mandel was assigned to the staff of the National Security Council from 1985-90, where she was Director for Arms Control and Defense Programs. Her responsibilities included implementation of the Intermediate Range Nuclear Forces (INF) Treaty, and nonproliferation matters. Her other assignments include teaching and directing the Russian and Eurasian Area Studies program at the National Foreign Affairs Training Center, and teaching political science and international relations at the National Defense University's Army College of Industrial Affairs. Her areas of expertise include Russian domestic and international politics, Russia's relations with the states of the Former Soviet Union, arms control and non-proliferation. Under the auspices of Georgetown University's Institute for Intercultural Education and Development, she has

also devised and carried out a program of diplomatic training for the Ministry of Foreign Affairs of Tajikistan.

Since joining URS Corporation, Ms. Mandel has worked to expand the company's markets internationally, and to develop global clients for three market sectors including: Threat Reduction (Nunn-Lugar Programs); Defense Infrastructure Services; and Homeland Security Services.

Ms. Mandel is a graduate of Sarah Lawrence College, in Bronxville, New York, and did work for her Master's in International Relations at Columbia University in New York City, where she was a candidate for a degree certificate at the Russian Institute and Institute on East Central Europe.

Dr. Jack Nunn is currently a Principal at Science, Strategy and Solutions, Inc. He has more than thirty-five years experience in government and industry, including service in the United States Army and civilian service in both the executive and legislative branches of the federal government. His civilian government service included assignment as a Senior Fellow and Acting Director of the Mobilization Concepts Development Center at the National Defense University. The Center was established to provide strategic resource advice to the Joint Chiefs of Staff and to the Office of the Secretary of Defense. He was also Professor of Resource Strategy at the Industrial College of the Armed Forces. In his last Government position he was a Senior Associate at the Congressional Office of Technology Assessment where he served as an advisor to the principal Congressional committees responsible for defense and national security. Mr. Nunn's private sector experience has focused on strategic planning and assessment for government and private clients. Most recently he has led a study for the Department of Homeland Security examining the evolution of the threat of terrorist use of radiological and nuclear weapons and the U.S. responses to those threats.

Mr. Nunn has written a number of studies on defense and science policy and a book examining the U.S./Soviet nuclear balance. He has testified before Congress and lectured on national security technology and industry topics both in the United States and abroad. He has traveled extensively in Asia, Europe and South America.

Mr. Nunn received his Ph.D. from the Massachusetts Institute of Technology. He has a Masters of Arts degree from the Johns Hopkins University School of Advanced International Studies, and a Bachelor of Science degree from the United States Military Academy.

Dr. Wayne Perry is Professor of Public Policy and Operations Research in the School of Public Policy at George Mason University. He conducts interdisciplinary research and teaches in science and technology policy, defense policy, international security and arms control policy, and regulatory policy, health policy, with a focus on policy analysis using quantitative methodologies. Current substantive areas of interest are policy studies in arms control and disarmament, defense manpower policy, long term health policy, risk management regulations, nuclear trade and weapons proliferation, science and

engineering education. Methodological interests are in the teaching, applications, and extensions to public policy analysis, and extensions of operations research/ management science, multivariate statistical and probabilistic models, stochastic processes, engineering economics, managerial economics and econometrics. He has directed research or consulting projects with the President's Commission on Industrial Competitiveness, National Defense University, Mathematics Policy Research, Inc., U.S. Departments of Defense, Energy, Commerce, Education, HUD, Labor, Transportation, NASA, NSF and leading corporations.

Prior to becoming a professor at George Mason University, he was Dean and Professor of Industrial Engineering, College of Engineering and Architecture and Director, Texas Engineering Experiment Station, The Texas A&M University System, Prairie View; Professor and Director, Division of Management Sciences, and MBA Program, Florida A&M University; Supervisor Ph.D. Students, the Pardee-Rand Graduate School of Public Policy; Senior Economist and Program Manager, The Rand Corporation; Instructor, and Research Fellow, The Heinz School of Public Policy and Management, Carnegie Mellon University; Engineering Project Director, Thermal Systems Design and Analysis, Sandia National Laboratories; and Industrial Engineer, Manufacturing Systems, Ford Motor Company. He received the Ph.D. from Carnegie Mellon University.

Mr. Steven L. Schleien is Director for Transnational Threats Policy in the Department of Defense (DoD). His office is responsible for DoD policy on preventing the proliferation of WMD, the Proliferation Security Initiative, WMD/missile-related interdiction, Missile Technology Control Regime, Australia Group, Nuclear Suppliers Group, negotiations on cluster munitions and the Conference on Conventional Weapons, and Oceans Policy. Mr. Schleien has also served in DoD as the Deputy Director for Nonproliferation Policy, Senior Assistant for NATO Policy, Deputy U.S. Permanent Representative to the Organization for the Prohibition of Chemical Weapons, and DoD Representative to the 2000 NPT Review Conference.

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