

2015 PONI FALL CONFERENCE AGENDA

Pacific Northwest National Laboratory (PNNL)
Richland, WA

Day One: Tuesday, September 22

8:00 SHUTTLE DEPARTS FROM SPRING HILL SUITES TO PNNL

8:30 CONFERENCE CHECK-IN & BREAKFAST

9:00 CONFERENCE WELCOME

Rebecca Hersman, Director Project on Nuclear Issues and Senior Adviser, International Security Program, Center for Strategic and International Studies

9:05 OPENING REMARKS

Tammy Taylor, Chief Operating Officer, National Security Directorate, Pacific Northwest National Laboratory

9:15 TRACKING NUCLEAR MATERIALS

Panel Moderator: Vayl Oxford, National Security Executive Policy Advisor, Pacific Northwest National Laboratory

Active Seals for Warhead Monitoring

Eric Gonzalez, Electronics Technology Developer, Pacific Northwest National Laboratory

What Was Missed? Opportunities in Mapping Illicit Nuclear Trafficking

Sara Niehus, Nonproliferation Analyst, Pacific Northwest National Laboratory
George Muller, Operations Research Specialist, Pacific Northwest National Laboratory

The Power of Financiers and Insurers to Reduce Proliferation Risks: Nuclear Dual-Use Goods

Rachel Weise, Legislative and Regulatory Affairs Analyst, Pacific Northwest National Laboratory

10:45 BREAK

11:00 NUCLEAR SECURITY AND INSIDER THREATS

Panel Moderator: David Schnaars, American Association for the Advancement of Science (AAAS)
Science and Technology Policy Fellow, Department of State

International Policies and Tools for Protecting Against Radiological Sabotage

Rosalyn Leitch, Security Specialist, Pacific Northwest National Laboratory

Nuclear Security Requires Cyber Security

David McKinnon, Senior Cyber Security Researcher, Pacific Northwest National Laboratory

Culture of the Nuclear Enterprise and its Effects in the Middle East

Kaitlyn Riffenburg, Student Scholar, National Security Studies Program, and Political Affairs Intern,
The Borgen Project

Nuclear In-Security: Defining the Insider Threat Using a Multidisciplinary Approach

Christine Noonan, National Nuclear Security Specialist, Pacific Northwest National Laboratory

12:40 LUNCH**1:40 BREAK-OUT DISCUSSION: INDIA-PAKISTAN****3:00 DISCUSSION AND SUMMARY OF BREAK-OUT**

Moderator: Rebecca Hersman, Director, Project on Nuclear Issues and Senior Adviser, International Security Program, Center for Strategic and International Studies

3:45 TECHNICAL TALK

Dr. Eric Smith, Senior Research Scientist, Pacific Northwest National Laboratory

5:00 SHUTTLE DEPARTS FOR SPRING HILL SUITES**6:00 RECEPTION**

Spring Hill Suites Kennewick Tri-Cities
7048 W Grandridge Blvd, Kennewick, WA 99336

7:00 DINNER & EVENING KEYNOTE ADDRESS

Lieutenant General Frank Klotz, Under Secretary for Nuclear Security and Administrator for the National Nuclear Security Administration (NNSA)

8:30 END OF DAY ONE

Day Two: Wednesday, September 23**8:00 SHUTTLE DEPARTS FROM SPRING HILL SUITES TO PNNL****8:30 BREAKFAST****9:00 REGIONAL NUCLEAR FLASHPOINTS**

Panel Moderator: Rebecca Hersman, Director, Project on Nuclear Issues and Senior Adviser,
International Security Program, Center for Strategic and International Studies

Revisiting History: Is Islamabad's Bomb a Gambit for Power?

Ahsan Yousaf Chaudhary, Commonwealth Scholar and MSc. Candidate in International Relations,
University of Bristol

**Limited Nuclear Options for the Entente Cordial: Pakistan's Flexible Nuclear Strategy
& Strategic Implications of Technology Transfer**

Robert Ryan, Master's Candidate, Columbia University

U.S. Involvement in an Escalating Conflict with a Nuclear Adversary

Sam Wilson, Senior Analyst, Government Accountability Office

10:40 BREAK**11:00 RETHINKING PROLIFERATION**

Panel Moderator: Bob Butterworth, President, Aries Analytics, Inc., and Adjunct Professor, Jackson
School of International Studies, University of Washington

New Concepts on Proliferation

Anthony Eames, PhD Candidate, Georgetown University

Correlates of Proliferation: Introducing a New Data Tool

Tom Hickey, Master's in Public Policy Candidate, and Fellow, Nuclear Science and Security
Consortium, University of California at Berkeley

Parallels Between Norm Development in the Nuclear and Space Domains

Becca Arbacher, Undergraduate Student, Columbia University

12:30 LUNCH**1:30 DEPART FOR OPTIONAL TOURS**

Tour Option 1: B Reactor

Tour Option 2: HAMMER

5:00 END OF CONFERENCE**SHUTTLE DEPARTS FOR HOTEL**

Speakers Biographies

CONFERENCE WELCOME

Rebecca Hersman, *Director, Project on Nuclear Issues and Senior Adviser, International Security Program, Center for Strategic and International Studies*

Rebecca Hersman is director of the Project on Nuclear Issues and senior adviser for the International Security Program. Ms. Hersman joined CSIS in April 2015 from the Department of Defense, where she served as deputy assistant secretary of defense for countering weapons of mass destruction (WMD) since 2009. In this capacity, she led DoD policy and strategy to prevent WMD proliferation and use, reduce and eliminate WMD risks and respond to WMD dangers. Ms. Hersman was a key leader on issues ranging from the nuclear security summit to the elimination of Syria's chemical weapons to the global health security agenda. She served as DoD's principal policy advocate on issues pertaining to the Biological Weapons Convention, Chemical Weapons Convention, Nuclear Non-Proliferation Treaty and Cooperative Threat Reduction Program. Prior to joining the Department of Defense, Ms. Hersman was a senior research fellow with the Center for the Study of Weapons of Mass Destruction at the National Defense University from 1998-2009. Her primary projects focused on the role of the Department of Defense in mitigating the effects of chemical and biological weapons attack, concepts and strategies for eliminating an adversary's WMD programs, as well as proliferation issues facing the United States. Ms. Hersman also founded and directed the WMD Center's Program for Emerging Leaders, an initiative designed to shape and support the next generation of leaders from across the U.S. government with interest in countering weapons of mass destruction. Ms. Hersman previously held positions as an international affairs fellow at the Council on Foreign Relations, a special assistant to the undersecretary of defense for policy, and a member of the House Armed Services Committee professional staff. She holds an M.A. in Arab Studies from Georgetown University and a B.A. from Duke University.

OPENING REMARKS

Tammy Taylor, *Chief Operating Officer, National Security Directorate, Pacific Northwest National Laboratory*

Tammy Taylor is the Chief Operating Officer of the National Security Directorate at the Pacific Northwest National Laboratory. She leads the mission execution, capability development, and project management of the directorate of three divisions and four project management offices. Prior to joining PNNL in the summer of 2013, Dr. Taylor served in a number of positions over 14 years at Los Alamos National Laboratory including the Deputy Associate Director of Chemistry, Life and Earth Sciences, the Division Leader of Nuclear Engineering and Nonproliferation, a group leader, project leader, staff member and Director's Postdoctoral Research Fellow. From early 2007 to mid 2010 she was an Intergovernmental Personnel Act assignee from LANL in the Office of Science and Technology Policy (OSTP) in the Executive Office of the President. She managed the national science and technology portfolio on nuclear defense issues including nonproliferation, detection, render safe, and attribution, as well as nuclear detonation response and recovery issues such as

preparedness, planning, medical countermeasures, decontamination, and long-term recovery within the National Security and International Affairs Directorate of OSTP for Dr. John Holdren and Dr. Jack Marburger, Science Advisors to President Obama and President Bush, respectively. Dr. Taylor has conducted research and performed program development activities on topics related to radiological/nuclear threat reduction and environmental restoration. She has expertise working with the emergency responder community to identify needs in support of radiological and nuclear terrorism preparedness and adapt traditional emergency response to response involving terrorism threats. Her research prior to September 11, 2011 focused on environmental remediation of groundwater and safe handling, fate, and remediation of beryllium. Dr. Taylor has an MS and PhD in Environmental Engineering from the Georgia Institute of Technology. Her undergraduate degree in Civil Engineering is from New Mexico State University. She is a member of NCRP and a long-time member and supporter of the American Nuclear Society, the American Society of Testing and Materials, the Health Physics Society, and the Institute of Nuclear Materials Management.

PANEL 1: TRACKING NUCLEAR MATERIALS

Moderator: Vayl Oxford, *National Security Executive Policy Advisor, Pacific Northwest National Laboratory*

Vayl S. Oxford is the National Security Executive Policy Advisor at the Pacific Northwest National Laboratory (PNNL) where he is responsible for working with the National Security Directorate (NSD) and PNNL leadership to guide the strategic direction and vision for National Security issues. Specifically, he works with the NSD Sector, Project Management Office, Division, and Account leads to help focus NSD initiatives based on national-level priorities, and to create opportunities for NSD to provide thought leadership at the national-level. His career highlights include serving at the Department of Homeland Security (DHS) from October 2003 to January 2009, where he held the positions of Policy Advisor to the Under Secretary of Science & Technology, Acting Director of the Homeland Security Advanced Research Projects Agency, and as the first Director of the Domestic Nuclear Detection Office (DNDO). As the DNDO Director, he led the development of the National Strategy to Combat Nuclear Terrorism. Prior to his appointment to DHS, Mr. Oxford served as the Director for Counterproliferation at the National Security Council, where he supported the development of the President's National Strategy to Combat Weapons of Mass Destruction (WMD), the policy and strategy for WMD interdiction, and represented the NSC in the development of the National Biodefense Strategy. He chaired the interagency working group for Operation Iraqi Freedom to develop policies for combating WMD in Iraq, to include developing the initial concept for WMD exploitation and elimination, and the plan for foreign consequence management to protect civilian populations from potential Iraqi use of WMD. From 1987 to January 2002, Mr. Oxford held several positions within the Defense Threat Reduction Agency. As the Director for Counterproliferation, he led DoD's counterforce efforts to identify, characterize and defeat WMD facilities to include oversight of two Advanced Concept Technology Demonstrations that delivered advanced conventional weapons, hard target defeat fuzes and advanced mission planning systems for WMD facility defeat to USEUCOM. He is a graduate of the U.S. Military Academy and earned his Masters of Aeronautical Engineering from the Air Force Institute of Technology.

Eric Gonzalez, *Electronics Technology Developer, Pacific Northwest National Laboratory*

Eric Gonzalez is an Electronics Technology Develop at Pacific Northwest National Laboratory. Gonzalez works on a health monitor system for the Hellfire missile developing the sensors, determining how the

sensors should work and building the prototype systems to deploy and collect data. Additionally he has worked on the development of an integrated Active RF Seal for monitoring the integrity of a containerized asset through its lifecycle.

Sarah Niehus, *Nonproliferation Analyst, Pacific Northwest National Laboratory*

Sara Niehus is a nonproliferation analyst at the Pacific Northwest National Laboratory in the Nuclear Engineering and Analysis group where she has focused on topics such as nuclear nonproliferation; nuclear fuel cycle research and development; research of non-state actor/WMD nexus; exploring insider threat; strategic commodity export control; international trade analysis; and remote sensing capabilities. She earned a Master's degree in Engineering from The Ohio State University and holds a Professional Engineering License for the State of Washington.

George Muller, *Operations Research Specialist, Pacific Northwest National Laboratory*

George A. Muller is an Operations Research Scientist specializing in systems modeling and analysis, optimization, and operational simulation. He works on national security challenges from epidemiological modeling to detecting nuclear smuggling. He has experience in diverse problem sets, including pandemic influenza spread, international air passenger screening, and simulation of nuclear materials detection for land and maritime domains. Mr. Muller earned his B.S. in Industrial Engineering from Southern Illinois University Edwardsville and is pursuing a M.S. in Systems Engineering from Missouri University of Science and Technology.

Rachel Weise, *Legislative and Regulatory Affairs Analyst, Pacific Northwest National Laboratory*

Rachel A. Weise is a legislative and regulatory affairs analyst in the Seattle office of Pacific Northwest National Laboratory. Her current work focuses on nuclear nonproliferation and security, including regulatory development and engagement with the private sector about export control and reduction of proliferation risks along manufacturing supply chains. Ms. Weise is also working on initiatives to promote nuclear security education, as part of the U.S. Department of Energy National Nuclear Security Administration's Next Generation Safeguards Initiative. Ms. Weise joined the Laboratory in September 2014. Prior to that she worked in Washington, D.C., for a small public interest law firm that represents whistleblowers who bring to light fraud against the U.S. federal and state governments. Ms. Weise holds a joint degree, with a Juris Doctor from New York University School of Law and a Master in Public Affairs from Princeton University's Woodrow Wilson School of Public and International Affairs. She received her B.A. in Political Science from the University of California-Berkeley.

PANEL 2: NUCLEAR SECURITY AND INSIDER THREATS

Moderator: David Schnaars, *American Association for the Advancement of Science (AAAS)
Science and Technology Policy Fellow, Department of State*

Rosalyn Leitch, *Security Specialist, Pacific Northwest National Laboratory*

Rosalyn Leitch has been a Security Specialist with NSD's National Security Directorate for two years. In this capacity, she provides project management, strategic planning, contract, and logistics support for the U.S. Department of Energy's National Nuclear Security Administration (NNSA) on issues including physical protection, cyber security, and international safeguards. Rosalyn also completed a three month detail as the Acting Nuclear Security Attaché with the U.S. Mission to International Organizations in Vienna (UNVIE) in the beginning of 2014. Prior to joining PNNL, Rosalyn served as a Nonproliferation Graduate Fellow with NNSA's Office of Nonproliferation and International Security and a Security Specialist with the Nuclear Regulatory Commission (NRC). Rosalyn studied received her BA in International Relations from Seattle Pacific University and MA in Security Studies and Nonproliferation from Georgetown University's School of Foreign Service.

David McKinnon, *Senior Cyber Security Scientist, Pacific Northwest National Laboratory*

A. David McKinnon, Ph.D., is a Senior Cyber Security Researcher in the Cyber Security group at the Pacific Northwest National Laboratory. His research interests are in cyber security and distributed sensor systems. Dr. McKinnon leads research efforts focused on enhancing cyber security within the energy delivery sector. He is a cyber security subject matter expert for the US Department of Energy; helping utilities throughout the nation secure their smart grid projects. He has led efforts to develop network communications for embedded sensor systems and nuclear detection systems. Dr. McKinnon is an adjunct professor at Washington State University where he teaches computer and network security. He is a member of the ACM and a senior member of the IEEE.

Kaitlyn Riffenburg, *Student Scholar, National Security Studies Program, and Political Affairs Intern, The Borgen Project*

Kaitlyn Riffenburg is a student scholar with the National Security Studies Program at the University of New Mexico, and is an intern with the Borgen Project. She holds a degree from the University of New Mexico in anthropology and political science with concentrations in the Middle East, Asia, human rights, war and peace, global health, foreign policy, statistical analysis, strategic communication and international security.

Christine Noonan, *National Security Specialist, Pacific Northwest National Laboratory*

Ms. Christine Noonan is a National Security Specialist at Pacific Northwest National Laboratory in Richland, WA. Her research interests include tactical and strategic intelligence, insider threat, and counter-proliferation. She conducts research in support of human, cultural, social, behavioral and cyber security initiatives in support of national security mission needs. Ms. Noonan has BS and MA degrees in anthropology, a Master's in Library & Information Sciences, and post-graduate certifications in management and intelligence analysis.

TECHNICAL TALK

Dr. Eric Smith, *Senior Research Scientist and Program Manager, Pacific Northwest National Laboratory*

Dr. Eric Smith is a senior research scientist and program manager at Pacific Northwest National Laboratory (PNNL). Eric's primary research and development contributions have been in nondestructive assay (NDA)

methods for nuclear fuel cycle safeguards, trace radionuclide detection techniques, and modeling methods for safeguards and nuclear security scenarios. He also manages PNNL's business development activities in the area of international safeguards, arms control verification, and export control. From 2010 to 2013, Eric was on assignment with the International Atomic Energy Agency's (IAEA) Department of Safeguards, where he worked on unattended NDA instrumentation and safeguards concepts for various fuel cycle facilities, including uranium enrichment plants, heavy water reactors, spent fuel handling facilities, and geologic repositories. As a staff engineer at Argonne National Laboratory (1998-2001), Eric developed NDA techniques and instruments for material accountancy, particularly pertaining to electrometallurgical reprocessing of fast reactor fuel. Eric's research has produced over 25 peer-reviewed journal articles, over 60 conference papers, numerous technical reports, and two patents. Dr. Smith received a BS degree in Nuclear Engineering from Oregon State University; MS and PhD degrees in Nuclear Engineering and Radiological Sciences from the University of Michigan.

KEYNOTE ADDRESS

Lieutenant General Frank Klotz, *Under Secretary for Nuclear Security and Administrator for the National Nuclear Security Administration*

Lieutenant General Frank G. Klotz, United States Air Force (Ret), was confirmed by the Senate on April 8, 2014, as the Department of Energy's Under Secretary for Nuclear Security and Administrator for the National Nuclear Security Administration (NNSA). As Under Secretary for Nuclear Security, Lt. Gen. Klotz is responsible for the management and operation of the NNSA, as well as policy matters across the Department of Energy and NNSA enterprise in support of President Obama's nuclear security agenda. Prior to his Senate confirmation, Lt. Gen. Klotz served in a variety of military and national security positions. As the former Commander of Air Force Global Strike Command, a position he held from 2009 to 2011, he established and then led a brand new 23,000-person organization that merged responsibility for all U.S. nuclear-capable bombers and land-based missiles under a single chain of command. From 2007 to 2009, Lt. Gen. Klotz was the Assistant Vice Chief of Staff and Director of the Air Staff. He served as the Vice Commander of Air Force Space Command from 2005 to 2007 and was the Commander of the Twentieth Air Force from 2003 to 2005. Lt. Gen. Klotz served at the White House from 2001 to 2003 as the Director for Nuclear Policy and Arms Control on the National Security Council, where he represented the White House in the talks that led to the 2002 Moscow Treaty to reduce strategic nuclear weapons. Earlier in his career, he served as the defense attaché at U.S. Embassy Moscow during a particularly eventful period in U.S.-Russian relations. A distinguished graduate of the U.S. Air Force Academy, Lt. Gen. Klotz attended Oxford University as a Rhodes Scholar, where he earned an MPhil in international relations and a DPhil in politics. He is also a graduate of the National War College in Washington, DC. Most recently, Lt. Gen. Klotz was a senior fellow for strategic studies and arms control at the Council on Foreign Relations.

PANEL 3: REGIONAL NUCLEAR FLASHPOINTS

Moderator: Rebecca Hersman, *Director, Project on Nuclear Issues and Senior Adviser, International Security Program, Center for Strategic and International Studies*

Ahsan Yousaf Chaudhary, *Commonwealth Scholar and MSc. Candidate in International Relations, University of Bristol*

Ahsan Yousaf Chaudhary is a Commonwealth Scholar and MSc. Candidate in International Relations at University of Bristol, United Kingdom. Earlier, he has studied law and defended Masters' thesis on nuclear disarmament. His interests include civil-military relations, democratization, non-proliferation, international relations theory and strategic stability in South Asia. He is also presenting his research on 'epistemic nuclear accidents theory' in International conference on Global Nuclear Order at University of Birmingham this September.

Robert Ryan, *Master's Candidate, Columbia University*

Robert is graduate student at Columbia University's School of International and Public Affairs, where he is pursuing a Master's Degree in International Security Policy. His interests include diplomacy and military statecraft, and contemporary and comparative issues in nuclear weapons policy. Prior to graduate school, Robert worked in the energy industry assisting international clients with operations development needs. He frequently joined U.S. Department of Energy and national laboratory personnel on energy security projects. From these experiences Robert became interested in the military dimensions of the nuclear sector. Having also worked briefly on Capitol Hill, his familiarity with the policy arena aided in the transition to academia. Originally a Chicagoan, Robert is glad to have called both Washingtons home at various times.

Sam Wilson, *Senior Analyst, Government Accountability Office*

Sam Wilson is a senior analyst at the Government Accountability Office. His work has covered a variety of defense-related topics, including DOD's plan to implement New START; DOD's process for designating imminent danger pay; and DOD's military presence, infrastructure, and host nation agreements in the Middle East and Southwest Asia. Sam received his Master in Public Policy and Bachelor of Arts degrees at the University of Virginia.

PANEL 4: RETHINKING PROLIFERATION

Moderator: Bob Butterworth, *President, Aries Analytics, Inc., and Adjunct Professor, Jackson School of International Studies, University of Washington*

Butterworth is President of Aries Analytics, Inc., and principal investigator for the company's national security research, specializing in strategic space and nuclear force issues. He is also an adjunct professor at the University of Washington's Jackson School of International Studies, and is the author of several contributions to basic and applied research in international affairs and national security studies. His government service includes work on defense and intelligence programs in the White House, the U.S. Senate, and the Department of Defense, and more recently as Chief, Strategic Planning, Policy, and Doctrine for Air Force Space Command. He has also been a visiting faculty member at the Air War College and an adjunct professor at George Washington University, and has provided expert testimony to Congress on national security issues. Prior to joining the government, he was tenured at Pennsylvania State University, teaching and conducting research in international relations, national security policy, and research methods. His undergraduate work was at the University of Washington and his graduate degrees are from the University of California at Berkeley.

Anthony Eames, *PhD Candidate, Georgetown University*

Anthony Eames is a historian of science, technology, and diplomacy in the twentieth century. He is the author of several pieces on Anglo-American nuclear culture and diplomacy. He currently is based out of Georgetown University where he leads the Nuclear Issue Seminar series.

Tom Hickey, *Master's in Public Policy Candidate, and Fellow, Nuclear Science and Security Consortium, University of California at Berkeley*

Tom Hickey is a second year Master of Public Policy student at the University of California, Berkeley focusing on nuclear security and nonproliferation policy. As a fellow with NSSC, Tom is leading efforts to create a new database for nonproliferation researchers called Correlates of Proliferation, which will soon be available online. He recently completed the PONI Nuclear Scholars Initiative in Washington D.C. at CSIS. Tom has just completed a policy internship at Sandia-Livermore National Laboratory and also attended Public Policy and Nuclear Threats (PPNT) bootcamp at University of California, San Diego.

Becca Arbacher, *Undergraduate Student, Columbia University*

Becca is a rising senior at Columbia University, double majoring in physics and political science. She has conducted physics research at NASA Goddard Space Flight Center, Columbia's Plasma Physics Lab, and the Harvard-Smithsonian Center for Astrophysics focusing on plasma behavior, solar magnetohydrodynamics, and the impact of the solar wind on the upper layers of Earth's atmosphere. The implications of her research on nuclear technology and satellite communications ignited her growing interest in national security policy and its intersections with science and technology. She spent this past summer interning at the U.S. State Department, where she worked on emerging security challenges and their effects on strategic stability. She is looking forward to coupling her scientific and public policy background to make contributions to the field of national security.