

Departmental Response:

Assessment of the Report of the SEAB Task Force on Nuclear Nonproliferation



Introduction

Despite many successful U.S. efforts in nuclear nonproliferation, daunting challenges remain. Some nations are pursuing nuclear weapons and others are expanding their nuclear arsenals; some stockpiles of nuclear weapons and nuclear-weapons-usable materials remain dangerously insecure; and rapidly changing technologies and greater availability of dual-use knowledge are increasing the opportunities for terrorists to obtain and use nuclear weapons capabilities against the United States and its allies and friends. Longstanding challenges to U.S. nonproliferation efforts are being joined by new obstacles and emerging dangers, at a time of declining resources. This state of affairs demands fresh thinking about ways to improve the effectiveness and efficiency of nuclear nonproliferation activities within the Department of Energy and across the U.S. Government.

SEAB Report of the Task Force on Nuclear Nonproliferation

On December 20, 2013, the Secretary of Energy established the Secretary of Energy Advisory Board (SEAB) Task Force on Nuclear Nonproliferation (TFNN). The Task Force's charge was to advise the DOE on future areas of emphasis for its nuclear nonproliferation activities by addressing the following questions:

1. What are the current and likely future challenges to nuclear nonproliferation?
2. What should DOE be doing to help the United States Government prepare to meet those challenges?
3. What are DOE's current areas of emphasis in nuclear nonproliferation?
4. In what ways should DOE's nuclear nonproliferation efforts be modified and/or expanded?
5. What obstacles stand in the way of making the recommended changes in DOE's nuclear nonproliferation activities, and how might they be overcome?

On March 31, 2015, the SEAB approved the final report of the Task Force, building on the Task Force's July 2014 Interim Report in which the Task Force addressed several timely and important issues that, in its view, merited prompt attention. The SEAB's Final Report noted that DOE has made significant progress toward implementation of key recommendations in the Task Force's Interim Report to include: preparing and recently issuing NNSA's first strategic plan to address the threats of nuclear proliferation and terrorism (the NNSA report, *Prevent, Counter, and Respond—A Strategic Plan to Reduce Global Nuclear Threats, FY 2016-FY 2020*, March 2015); developing risk-informed priorities for nuclear nonproliferation; establishing the DOE

Nuclear Policy Council to serve as a mechanism for Department-wide consideration of cross-cutting nuclear issues; reorganizing the NNSA Office of Defense Nuclear Nonproliferation along the lines of “enduring missions;” and establishing a Council of DOE Headquarters and DOE national laboratories, plants and sites to coordinate nuclear nonproliferation strategy and planning, including (but not limited to) R&D. The Final Report, however, notes that improving U.S. nonproliferation efforts, particularly in an era of budget austerity, will also require better organizational structures and processes that can set and sustain priorities, leverage expertise, deploy resources more strategically, and enhance a whole-of-government approach.

DOE Assessment and Response to Recommendations

The SEAB’s Final Report explicitly addressed each element of the Task Force’s charge: assessing the emerging threat landscape and what should be done to meet it, examining DOE’s current areas of emphasis and potential misalignment, recommending actionable improvements, and suggesting how to overcome obstacles to successful implementation. Recommendations from the report and the actions being undertaken by DOE are highlighted in the table below.

While the Task Force was directed to advise the Department on its nuclear nonproliferation activities, DOE would like to point out that in pursuing its “prevent-counter-respond” strategy to reduce global nuclear threats, there are additional, complementary DOE functions beyond the nuclear nonproliferation function that contribute to addressing these threats. These supporting DOE risk reduction functions include:

- nuclear threat device assessments for non-stockpile and/or improvised nuclear devices;
- enhancing worldwide capabilities for WMD counterterrorism and incident/emergency response;
- maintaining the preparedness of U.S. Government and DOE nuclear emergency response assets through training and exercises, operational tool development, and equipment provision; and
- contingency planning for potential or emerging international threats, including providing technically-informed policy recommendations, threat assessments, and operational tools and capabilities in support of U.S. Government counterterrorism and counterproliferation objectives.

SEAB Task Force on Nuclear Nonproliferation Recommendations and Actions Summary

SEAB Recommendations	DOE Assessment and Actions
1. Support U.S. Government efforts to formulate and implement nuclear nonproliferation policies.	
<p>Recommendation 1-A: Ensure the effectiveness of an organizational structure that provides for integration within DOE of all aspects of nuclear policy (including nuclear weapons, nuclear nonproliferation, nuclear energy, nuclear waste, emergency response, and nuclear counter-terrorism).</p>	<ul style="list-style-type: none"> DOE concurs and as noted in the SEAB’s final report, DOE has established a Nuclear Policy Council, consisting of representatives from offices involved in all aspects of DOE’s nuclear portfolio, so as to integrate DOE nuclear policy development across the Department. DOE is also strengthening its nuclear policy contributions by consolidating all NNSA non-weapons activities into the Defense Nuclear Nonproliferation (DNN) budget account and through development and implementation of the strategy outlined in the NNSA “Prevent – Counter – Respond” report. In addition, the DOE Office of Nuclear Energy (DOE/NE) and NNSA’s Office of Defense Nuclear Nonproliferation (NNSA/DNN) have monthly coordination meetings, and DOE NE and DOE Office of Environmental Management (DOE/EM) also have monthly meetings to ensure coordination and integration. DOE/NE and NNSA/DNN have a signed MOU that regularizes and formalizes their interaction and coordination, and allows for ad hoc working groups to address cross-cutting topics as they arise.
<p>Recommendation 1-B: Improve mechanisms for integrating scientific and technical expertise (especially that which resides in the national labs) into nuclear policymaking.</p>	<ul style="list-style-type: none"> DOE concurs and as noted in the SEAB’s Final Report, NNSA has established a DNN-Lab Council to bring together NNSA Headquarters and National Lab Global Security offices to better integrate the national labs, plants, and sites into NNSA HQ nuclear security policy and program activities. This Council has already met three times,

Recommendation 1-C: Intensify efforts to anticipate and prepare for evolving and possible future threats to nuclear nonproliferation.

with a goal of meeting on a quarterly basis and mixing the meeting locations among the laboratories, plants, and sites as well as at DOE Headquarters.

- DOE concurs, and notes that NNSA’s “Over-the-Horizon” strategic planning effort also identified the need for a strategic planning function, working across the NNSA nuclear nonproliferation mission space, to help drive strategic analysis that would set and sustain near- and long-term priorities, based on comprehensive assessments of the nuclear proliferation risks. As part of the NNSA/DNN office realignment implemented in January 2015, NNSA/DNN is establishing a Strategic Planning and Integration office to perform this strategic planning function. NNSA also continues its Over-the-Horizon strategic studies to examine and identify trends over the next several years, in order to anticipate and prepare for future nuclear nonproliferation threats and challenges.
- NNSA has established HQ-Lab task forces to study the threat implications and possible NNSA program responses to specific issue areas, such as cyber-security and emerging, disruptive technologies (e.g., additive manufacturing). The Cyber Task Force is about to report on its analysis of the cyber threats to nuclear nonproliferation and a proposed roadmap of NNSA actions to address the threats.

2. Prevent nuclear and radiological terrorism.

Recommendation 2-A: Expand efforts to build a global nuclear materials security system of effective nuclear security norms, standards, and best practices worldwide.

- DOE concurs, and intends to continue its role as the U.S. government’s technical expert and lead implementer

in the Nuclear Security Summit process, pursuing and assisting others in accomplishing the Summit's specific nuclear security pledges and commitments. DOE also will work with international organizations (e.g., the IAEA) and non-governmental organizations (e.g., the World Institute for Nuclear Security, WINS) to expand efforts to strengthen nuclear security implementation according to internationally-accepted recommendations, and to develop and sustain best security practices, worldwide. For example, NNSA and IAEA recently co-sponsored the 25th International Training Course on the Physical Protection of Nuclear Material and Nuclear Facilities at Sandia National Laboratories. The International Training Course is considered IAEA's flagship course on physical protection of nuclear materials and facilities—over 800 students from 73 countries worldwide have participated in this course. NNSA will continue to host or co-host events such as the ITC, and new initiatives as they are developed.

Recommendation 2-B: Seek to rebuild nuclear security cooperation with Russia, and to strengthen bilateral nuclear security cooperation with other key states.

- DOE concurs, and notes that although the strategic environment has changed since the Secretary initiated the Task Force in 2013, NNSA will continue to engage Russian nuclear entities in cooperative activities where it is in our national interest to do so (subject to appropriate legal and policy authorization as needed) and where Russia continues to participate. NNSA will also continue to pursue cooperative nuclear security activities with foreign partners such as Belarus, China, India, Japan, Jordan, Kazakhstan, and South Korea.

Recommendation 2-C: Expand the effort to limit the number of places in the world where nuclear weapons and weapons-usable material exist, including both HEU and plutonium, both civilian and military materials.

- DOE concurs, and notes that the Department/NNSA (with the technical assistance of the DOE national laboratories, plants, and sites) has a central role in fulfilling the U.S. national security policy of preventing the spread of nuclear weapons and minimizing the use and amount of weapons-usable nuclear material worldwide. NNSA's Office of Material Management and Minimization (M³) continues to cooperate with governments and facilities around the world to remove weapons-usable nuclear materials for disposition, and to consolidate that material which remains. By 2020, M³ plans to remove or confirm the disposition of a cumulative total of 6,800 kg of nuclear material.
- Also, within the supporting text for Recommendation 2-C is a suggestion for DOE to offer incentives and assistance to countries to shut down their research reactors that are no longer needed. NNSA's M³ program cooperated with governments and facilities worldwide to verify the shutdown of 25 research reactors since 2004. While NNSA tracks and verifies shutdowns to measure international progress in HEU minimization, NNSA does not support offering incentives and assistance to shut down research reactors. The long-term success of the HEU-to-LEU reactor conversion efforts has been based on the idea that the NNSA reactor conversion program is not a "shutdown" program, but a program that works with facilities to help them operate more successfully with LEU fuel. Any implication that NNSA is proactively seeking to shut down facilities will damage the international trust built up over the years and could have a significant negative impact on our

Recommendation 2-D: Intensify the focus on identifying and reducing cyber vulnerabilities in nuclear systems worldwide.

reactor conversion efforts. NNSA believes that the IAEA would be a more appropriate organization to undertake such an effort.

- DOE concurs, and as mentioned earlier, notes that NNSA/DNN has established a NNSA-National Lab Task Force to study cyber issues relative to nuclear nonproliferation, and to make recommendations on how NNSA programs should take these priorities into account in their planning. The Task Force will produce its final report in the next few months.

3. Halt illicit transfers of nuclear technology.

Recommendation 3-A: Expand efforts to ensure that countries put in place effective export controls and enforcement and that black-markets are tracked and, when possible, eliminated.

- DOE concurs, but also notes that the job of building export control capacity globally involves many other players. DOE coordinates with other U.S. Government agencies, advanced partner countries, and regional organizations to leverage resources and subject matter expertise. DOE also takes a comprehensive approach to strengthening export control systems worldwide, in order to keep pace with changes in technology and commerce. DOE uses train-the-trainer approaches to develop capability and resources within partner countries so that they may sustain capacity building and other supporting activities on their own, over the long term.

4. Build the foundations for dealing with future nonproliferation challenges and opportunities.

Recommendation 4-A: Work with other relevant USG agencies to design and launch a comprehensive national research and development program on technologies and procedures for verifying future nuclear arms reductions.

- DOE concurs. NNSA, through its Defense Nuclear Nonproliferation R&D Program (DNN R&D), has been implementing a series of national comprehensive R&D test beds, developed in coordination, or in

partnership, with Departments of State and Defense, and members of the Intelligence Community. Six such test beds have been established for the spiral development of tools and techniques for verifying and monitoring nuclear warhead reductions, detecting proliferation, monitoring nuclear explosions, inspecting sites, and advancing nuclear forensics. While NNSA's significant, long-term funding commitments to these test beds has represented the majority of overall USG funding for a "national program," NNSA continues to work closely with its stakeholders to meet whole-of-U.S. Government objectives, regardless of their ability to support these areas with sustained funding. DOE agrees that the appropriately-sized effort would cost several tens of millions of dollars annually, and this is the order of magnitude of what NNSA invests now, and plans to invest in the future, subject to appropriated funding levels.

Recommendation 4-B: Intensify the focus of nonproliferation R&D on high-risk, high-reward innovations.

- DOE concurs that high-risk/high-reward projects are important. NNSA's DNN R&D program maintains a balanced portfolio that includes combinations of medium-to-high technical risk/medium-to-high reward projects, and that addresses requirements and priorities developed through a rigorous interagency process. DNN R&D has developed business models for incorporating and managing high risk/high-reward projects, in which DNN R&D still expects to see and measure advances in such projects, as there is a sufficiently high probability of success built into a number of tasks to mitigate the higher risk, but lower success rate, efforts.

Recommendation 4-C: Invest in the next generation of nuclear nonproliferation professionals.

- DOE concurs, and intends to continue its NNSA outreach to university students and post-graduates through targeted initiatives (e.g. the NNSA Graduate Fellows Program , the NNSA Internship Program, and NNSA Minority Severing Internship Program) to encourage more interest in pursuing professions in nuclear security fields, including nonproliferation. New initiatives, or improvements to existing efforts, are continuously under consideration by NNSA's Office of Management and Budget, which is responsible for these outreach efforts.
- NNSA's DNN R&D Program has established three university consortia that include student and early-career research fellowships so as to link complementary university and lab research in support of nuclear security objectives, build expertise in several technical areas relevant to nuclear security, and provide a conduit to migrate top talent toward technical applications in national nuclear security.
- NNSA's Office of Nonproliferation and Arms Control (NPAC) also works on the Next Generation Safeguards Initiative's (NGSI) Human Capital Development (HCD) program to recruit, educate, train, retain, and promote the next generation of international safeguards professionals, through the development of sustainable academic and technical programs. The HCD program encourages U.S. experts to seek employment at the IAEA, and identifies and trains a new cadre of safeguards experts to meet the future needs of both the United States and the IAEA. Since 2008, NGSI HCD has supported curriculum development in more than a dozen universities, sponsored over 400

internship and post-graduate research positions at the National Laboratories, and transitioned 80% of post-doctorates into permanent National Laboratory positions.

5. Provide intelligence to guide policy.

General Comment: Beginning with the 2007 establishment of DOE's Office of Intelligence and Counterintelligence as a consolidated, independent intelligence office, DOE has greatly improved its overall capabilities for conducting intelligence analysis, and as a result, intelligence support to policymakers is active and strong across the DOE enterprise.

Recommendation 5-A: Rebuild DOE's capabilities for conducting broad, integrated analyses of nuclear programs.

- DOE does not concur with the comment that an increased emphasis on specialization has led to a decay in DOE's overall capabilities for conducting intelligence analyses to develop a comprehensive picture of a nation's nuclear program. In fact, steps taken in recent years by the DOE Office of Intelligence and Counterintelligence (DOE IN) and NNSA, and supported by the Office of the Director of National Intelligence, have greatly strengthened the overall capabilities of the DOE National Laboratories in carrying out nonproliferation work. In addition, the claim in the SEAB's Final Report that substantial portions of funding have shifted from the DOE National Laboratories to DOE Headquarters is inaccurate, according to a review of budget data.

Recommendation 5-B: Strengthen – and share – intelligence on nuclear and radiological terrorism threats.

- Since the September 11, 2001 terrorist attack, DOE has greatly increased its focus on analysis of nuclear and radiological terrorism threats; we acknowledge that we may need to further strengthen that focus in the years ahead as the terrorism threat continues to evolve. DOE actively collaborates with multiple partners across the USG to ensure past and current intelligence leads are appropriately analyzed.

6. Manage the proliferation risks of nuclear energy.

Recommendation 6-A: DOE should promote and participate in an interagency effort to support U.S. commercial involvement with civilian nuclear activities around the world.

- DOE concurs, and notes that DOE/NE participates in the TEAM USA meetings held by the National Security Council staff, and coordinates support for U.S. civil nuclear commerce globally with the full interagency. DOE/NE also actively participates in the Department of Commerce-chartered Civil Nuclear Trade and Advisory Committee (CINTAC) and is a member of the Trade and Promotion Coordinating Committee Sub-Working Group on Nuclear Trade. The two organizations focus specifically on working with the U.S. government to help increase the international market share for U.S. civil nuclear commercial companies. DOE/NE leadership routinely advocates, to the extent allowed, for U.S. nuclear exports in bilateral meetings and bilateral fora.
- TEAM USA also is developing a variety of branding materials to highlight the U.S. nuclear energy education infrastructure to the international community. The goal is to increase awareness of the nuclear education and training capabilities available and accessibility for international students, and other stakeholders.

Recommendation 6-B: Accelerate and expand efforts to build an International Framework for Nuclear Energy Cooperation (IFNEC) that would strengthen incentives for nations to enjoy the benefits of nuclear energy without acquiring enrichment and reprocessing capabilities.

- DOE concurs, and notes that DOE/NE actively helps lead IFNEC, with a 64 country membership plus four multi-national organizations (the IAEA, the Generation IV International Forum, Euratom, and the OECD Nuclear Energy Agency, NEA). DOE/NE works to keep IFNEC focused and engaged in the area of developing and supporting international options for nuclear fuel supplies and waste management, specifically to serve as an alternative to indigenous development or acquisition of nuclear fuel enrichment and/or

reprocessing capabilities.

- Within IFNEC, DOE/NE takes a leading role for the United States in promoting the reliable nuclear fuel concept, through its representation in the IFNEC Reliable Nuclear Fuels Working Group, along with other key IFNEC members such as France, Japan, and the UAE. DOE/NE also routinely advances the reliable nuclear fuel concept in other international fora, including the IAEA.
- There are other areas of engagement within IFNEC that could also help advance these objectives at the policy level, via the Executive Committee and the Steering Group level and the Infrastructure Development Working Group that is chaired by the United States and the United Kingdom. Additionally, the United States has led the way for IFNEC to become even more global, with the NEA taking on the role of Secretariat. This should result in IFNEC playing a stronger role and might encourage additional nations to join.

7. Enhance U.S. approaches to plutonium management and disposition.

Recommendation 7-A: Undertake an expanded effort to improve management of plutonium separation and stocks around the world.

- DOE concurs, and notes that NNSA and DOE/NE co-chair expert-level meetings that provide representatives from different countries an opportunity to discuss issues related to plutonium management. These meetings provide a venue where participation does not indicate a country's endorsement of another country's plutonium management strategy, but rather allows for sharing of ideas on how best to manage inventories. DOE/NE and NNSA are engaged in collaborative plutonium management activities with Japan (the Plutonium Management Experts Group,

PMEG); with the United Kingdom (the Plutonium Management Users Group, PMUG); and with France through an International Roundtable on Plutonium Management that includes Japan and the United Kingdom. The PMEG has met three times and the first PMUG meeting took place in London April 23, 2015. The first International Roundtable took place in November 2014, and Japan has offered to host the next Roundtable later this year. Based on the results of the November meeting, the participants determined to start collaboration in smaller technical experts group to discuss technical topics and report their finding and recommendations for future collaboration under the International Plutonium Management Roundtable. The first such technical experts meeting on modeling and simulation will take place in Japan this summer.

Recommendation 7-B: DOE should explore alternatives to the U.S. MOX program for plutonium disposition.

- DOE concurs, and notes that in response to requirements in the 2015 Consolidated and Further Continuing Appropriations Act and the 2015 National Defense Authorization Act, the Department submitted two reports to Congress on plutonium disposition options. The Aerospace Corporation, a federally funded research and development center (FFRDC), led the independent efforts to assess and validate the analysis of options for disposing of 34 metric tons of weapon-grade plutonium mandated by Congress. In addition, Secretary Moniz requested in June 2015 that the Director of Oak Ridge National Laboratory assemble and lead a Red Team to assess options for the disposition of surplus weapon-grade plutonium and their analysis was completed in August 2015.