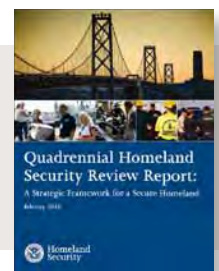
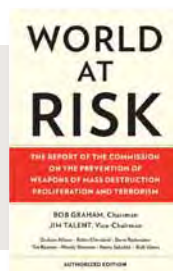
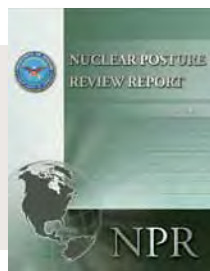


# Nonproliferation and Arms Control

*“In coming years, we must give top priority to discouraging additional countries from acquiring nuclear weapons capabilities and stopping terrorist groups from acquiring nuclear bombs or the materials to build them. At the same time, we must continue to maintain stable strategic relationships with Russia and China and counter threats posed by any emerging nuclear-armed states, thereby protecting the United States and our allies and partners against nuclear threats or intimidation, and reducing any incentives they might have to seek their own nuclear deterrents.”* – 2010 Nuclear Posture Review (NPR)



## Nuclear Threat Environment

The national security reality that U.S. leaders face today is very different from the bipolar environment of the Cold War era. In the diplomatic arena, today's leadership must engage multiple nuclear powers. On the defense front, the U.S. must meet the challenges posed by alienated nation states and terrorist networks across a broad range of exposure points.

U.S. policy – articulated in a number of documents including the NPR, the 2010 National Security Strategy and Quadrennial Defense Review – has evolved to recognize the growing complexity of today's nuclear threat environment. Sandia National Laboratories has worked for decades implementing national policy and developing technical options to respond to evolving nonproliferation and arms control challenges.

## Meeting the Nation's Nonproliferation and Arms Control Challenges

The technical capabilities and expertise that Sandia applies to creating effective nonproliferation and arms control solutions grew and has been sustained because of its unique role in the U.S. nuclear weapons enterprise. Sandia serves as both the systems integrator and the nonnuclear component engineering design laboratory for the enterprise.

Often acting in partnership with other national laboratories and the private sector, Sandia played a critical role in the development of national space and ground systems to monitor nuclear explosions, pioneered the systematic analysis and design of physical protection systems for both civilian and military nuclear facilities, developed the concept of portal perimeter monitoring for arms control and enabled international partners to secure nuclear materials around the world.

## Implementing National Nonproliferation Programs

Sandia's strategy in supporting the U.S. government's nonproliferation and cooperative threat reduction activities employs a systems approach — combining science, technology and operational expertise to both inform and implement policy. This includes performing work such as:

- Developing technologies and systems to enhance national



capabilities to assess, analyze, detect and respond to nonproliferation threats;

- Supporting the U.S. government negotiation and implementation of treaties and agreements; and
- Designing and implementing cooperative nonproliferation programs with global partners.

### Enhancing National Capabilities

Sandia's Nuclear Nonproliferation Detection Systems Program develops sensing technologies that operate in space, on



airborne platforms and in groundbased systems. Sandia contributed important components of the U.S. Nuclear Detonation Detection System, Sandia sensors fly aboard key defense satellites and researchers have developed multiple atmospheric monitoring technologies.

### Technical Solutions for Treaty Monitoring and Verification

Sandia develops a range of methods and technologies to fulfill the nation's treaty monitoring needs with an emphasis on unique identifiers for tagging, tamper-indicating devices, detection equipment and data security tools. Sandia developed radiation detection equipment that was used for monitoring the INF and START treaties and the same devices have been deployed to support New START. Future treaties, however, will likely demand a new generation of technologies.



### Cooperative Nuclear Nonproliferation and Threat Reduction

Cooperative programs have been a cornerstone of Sandia's global nuclear nonproliferation activities since the early 1990s and include policy analysis, training, individual engagement, and security implementations. Through the Global Threat

Reduction Initiative, Sandia works both domestically and internationally to assist organizations and gov-



ernments in securing dangerous materials. Sandia's Cooperative Monitoring Center has become a global model for engagement and collaboration on regional security issues.

### The Challenges Ahead

Going forward, Sandia sees significant challenges and opportunities for nonproliferation and arms control activities.

The U.S. will continue to engage with Russia on reducing nuclear stockpiles; however, the emphasis on verification will likely shift from verifying delivery vehicles to monitoring warheads. Verifying such an agreement will likely require novel technical approaches. The U.S. now has the opportunity to begin developing the next generation of tools needed to address the demands of future treaty obligations.

The growing relevance of China to U.S. national security will require strengthening strategic dialogues and also creating new frameworks for engagement. China is one of many countries with which the U.S. will need to engage to meet our nonproliferation and arms control objectives. Technical and scientific cooperation are proven and powerful platforms for addressing common security concerns while strengthening relationships.

The growing threat posed by alienated nation states and terrorist networks compels the international community as a whole to apply more robust approaches to nuclear defense. This will include enhancing the protection of nuclear materials as agreed at the 2010 Nuclear Security Summit. However, it will also require that the U.S. develop greater agility in adapting to new world challenges by investing in the exploration of innovative technology solutions. These challenges exist in an environment in which multiple departments and agencies with overlapping responsibilities face severely constrained budgets. Thus, integrating the required capabilities across multiple programs and setting priorities for the path forward in the face of constantly evolving threats adds complexity to this critical national security problem.

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