

# Preventing Weak Links in Nuclear Security: A Strategy for Soft and Hard Governance

## Summary Report & Initial Policy Recommendations

March 2014



*This report is based on discussions of the Nuclear Security Governance Experts Group (NSGEG) at its workshop on **Preventing Weak Links in Nuclear Security: A Strategy for Soft and Hard Governance** held on October 16-18, 2013 in Warrenton, Virginia. This workshop, part of a continuing project on nuclear security, was convened during the Stanley Foundation's 54<sup>th</sup> Annual Strategy for Peace Conference and organized by the Stanley Foundation with support from the Asan Institute for Policy Studies and Partnership for Global Security. This report and its recommendations draw upon major strands of discussion developed at the workshop and in its papers. They do not necessarily reflect the views of individual NSGEG members or other workshop participants who neither reviewed nor approved this document.*





# Responsibility Beyond Rules: Leadership for a Secure Nuclear Future

March 2013

## Executive Summary

The current nuclear security regime is not robust, adaptable, or coherent enough to adequately protect against the intensifying and evolving threats posed by nuclear terrorism in the 21st century. The governance system for nuclear security is in need of significant improvement in three areas: greater coherence and confirmed effectiveness, enhanced transparency, and increased international confidence, including through shared assessments of performance and cooperation.

The current nuclear security regime has improved over time, but this evolution has been too slow and is incomplete. It relies primarily on opaque national structures and voluntary commitments to prevent nuclear and radiological terrorism. While there are a limited number of binding international agreements covering aspects of nuclear security, adherence to them is incomplete, assessing compliance is difficult, and they leave significant gaps in the system.

The Nuclear Security Summit (NSS) process raised the profile of nuclear security and initiated a dialogue among more than 50 heads of state and international organizations. However, the primary focus of the first two summits in Washington (2010) and Seoul (2012) was on effective implementation of the current regime, rather than identifying and addressing its shortcomings and building a sustainable global regime for the future. The third summit, taking place in the Netherlands in 2014, offers leaders an opportunity to demonstrate global leadership and responsibility beyond today's rules and regulations by endorsing improvements to the international nuclear security system that emphasize confirmed performance and accountability. The governance structures of the current regime cannot be reformed overnight, but the process must be initiated by 2014.

This document details five steps and 30 recommendations for significantly strengthening the global nuclear security regime and creating the foundation for its long-term effectiveness and adaptability. These steps and the recommendations result from three international workshops held by the Nuclear Security Governance Experts Group (NSGEG) in 2012. The goal is to enable substantial nuclear security regime improvements by 2020.

The five steps forward are:

1. Defining the scope of nuclear security
2. Universalizing the current regime
3. Adopting the principle of continuous improvement
4. Addressing political challenges
5. Creating a unifying instrument

The recommendations fall under one of three categories. They offer a range of concrete actions that nuclear security policymakers, regulators, industry representatives, international organization officials, and nongovernmental experts can pursue together to advance global nuclear security governance. Many recommendations are directed specifically at the organizers and participants of the 2014 NSS, but the scope of the NSGEG's work is not limited to that event or to those participants.

The three categories of recommendations are:

1. Improving regime cohesion
2. Promoting greater transparency
3. Building international confidence

The NSGEG plans to use this document to advocate for measures that will strengthen nuclear security in the long term, while promoting the specific, near- and medium-term steps necessary to begin this process of improvement. The 2014 NSS will be a success if countries commit to sustaining high-level political attention to this issue, agree on the importance of greater information sharing to improve nuclear security, and formally recognize the need for a unifying instrument for the global nuclear security regime to be followed by a process to develop and negotiate a framework agreement for nuclear security with the goal of entry into force by 2020.

*This is a consensus document endorsed by the members of the NSGEG, but it does not necessarily represent the views or have the endorsement of their affiliated institutions.*

## The Importance of Nuclear Security

The security of fissile materials, radioactive sources, and nuclear facilities has been a global concern since the beginning of the nuclear age. However, it has often been treated as solely a national concern and as an area for technical experts to manage rather than for global policymakers to drive. This perspective changed with the concern about “loose nukes” following the collapse of the Soviet Union, the terrorist attacks on September 11, 2001, and the expressed goal of some terrorist groups to acquire nuclear materials. These events highlighted the danger posed by nuclear terrorism and led to a number of actions to address the problem both internationally and within national borders. But technical and nuclear experts primarily shaped these actions. In 2009, U.S. President Barack Obama pledged to host a summit-level meeting on the challenges posed by the threat of nuclear terrorism and the additional actions the global community should take to improve the security of nuclear materials worldwide.

This evolution of the nuclear security discussion underscored the reality that improving the protection of nuclear assets is much more a matter of political will than a technical challenge. It also made clear that the focus must be on preventing nuclear terrorism, not responding to its consequences after it has occurred. It is clear that the nuclear security regime can and should be significantly improved. Therefore, the burden is on those nations and leaders that believe the current nuclear security system is adequate to show why it is so.

The Nuclear Security Summits (NSS) in Washington in 2010 and in Seoul in 2012—and their corresponding nuclear expert and industry corollary events—have opened a window of opportunity to develop new strategies and policies for the improvement of global nuclear security. The current nuclear security regime has improved over time, but it is still not comprehensive or strong enough to address the evolving challenges of the 21st century. It also lags behind other regimes that govern nuclear safeguards, safety, and arms control in terms of its binding requirements and assurances of compliance. To change this, and create a secure nuclear future, all nations will have to exhibit responsibility beyond the written rules and regulations and demonstrate global leadership.

While the summits have taken the important step of establishing global fissile material security as a top-level international objective, a more robust, effective, and flexible 21st century nuclear security architecture will require additional and likely more controversial actions beyond the current international consensus. To date, the focus has been on what can be done most easily to strengthen the nuclear security system, rather than what will be most effective at preventing nuclear terrorism. This could lead to a false sense of progress and protection, while gaps or weak links that terrorists can exploit remain. Therefore, what is needed is an international nuclear security regime that is more comprehensive, integrated, and transparent and which emphasizes confirmed performance and accountability by all nations in order to build international confidence.

The challenge is to identify mechanisms that promote this increase in international confidence in a way that balances the sovereign responsibility that nations have for managing their nuclear infrastructure and materials with the increasingly clear international impacts of incidents that result in unauthorized releases of radiation. As United Nations (UN) Secretary-General Ban Ki Moon declared, “The effects of nuclear accidents respect no borders. To adequately safeguard our people, we must have strong international

consensus and action.” This is as applicable to an international nuclear terrorist attack as it is to an unintentional nuclear reactor accident.

### Recent Progress

Most of the recent progress on global nuclear security has resulted from the NSS process (see Appendix III). Two summits have been held and a third is being planned for the Netherlands in 2014.

These summits have involved more than 50 nations and international organizations and resulted in a broad range of political commitments to strengthen nuclear security measures at home and abroad. The 53 states gathered in Seoul at the second NSS represented approximately 80 percent of the world’s population, 90 percent of its gross domestic product, and one-third of the International Atomic Energy Agency’s (IAEA) member states. These states also possess approximately 99 percent of global nuclear material holdings. States have executed nuclear material removals, consolidations, and reactor conversions as part of their commitments under the NSS. They also have updated national laws, regulations, and export control systems and enhanced physical protection at facilities containing nuclear and radioactive materials.

Participation in voluntary international initiatives has also increased. This includes membership in the Global Initiative to Combat Nuclear Terrorism (GINCT) and ratification of the nuclear security-relevant international treaties and conventions. States contributed additional funding and support to the IAEA’s Nuclear Security Fund (NSF), UN Security Council (UNSC) Resolution 1540, the World Institute for Nuclear Security (WINS), and multilateral threat reduction projects. New international research projects have been launched, and awareness of the importance of robust nuclear security culture has grown, as demonstrated by new countries hosting workshops and trainings and establishing nuclear security centers of excellence.

The NSS also has established several new precedents in the nuclear security arena. One is the international legitimacy of multilateral efforts to improve nuclear material security that are initiated by or include a select group of nations. The initiatives are a supplement to the objective of universal action in support of nuclear security.

The summits have introduced the ability for nations to make unilateral and multilateral commitments in support of improved nuclear security. Twelve joint statements or “gift baskets” were issued by a variety of nations in Seoul that outline actions they intend to take or express their commitment to work together to advance issues such as highly-enriched uranium (HEU) minimization, counter nuclear smuggling, and transport security.

Related to these commitments, the summit process has also opened the door to additional information sharing by states on nuclear security. At the 2012 NSS, 49 states submitted progress reports detailing how they were implementing summit commitments. These reports were published online. Though the quality of reporting varied, it was a good first step toward greater transparency and international accountability in the nuclear security regime.

Also, the scope of nuclear security has broadened under the NSS process. At the first summit in 2010, leaders endorsed a four year international effort to secure all vulnerable nuclear material worldwide. At

the second summit in 2012, leaders expanded their focus to include radioactive source security and the interface between nuclear safety and security.

Another important precedent the NSS process established is seeking to achieve goals within set timeframes. Nearly all the national political commitments made at the 2010 NSS were completed before the Seoul summit. The Seoul communiqué included important new milestones for countries to reach prior to the third summit, including entry into force of the Convention on the Physical Protection of Nuclear Materials (CPPNM) amendment. With each summit, the bar is raised for nuclear security progress because the heads-of-state level summits serve as a forcing mechanism.

## Vision and Goals

Despite the very positive progress made at the summits, the international nuclear security system still suffers from significant gaps and limitations, including a lack of regime cohesion, weak transparency, and fragile international confidence. In its *Nuclear Security Plan 2010-2013*, the IAEA states that “all States have responsibilities to establish appropriate systems to prevent, detect and respond to malicious acts involving nuclear or other radioactive material. Not doing so may create a weak link in global nuclear security.”

### *Preventing Weak Links*

The essence of the nuclear security challenge is preventing weak links in the international system that can be exploited for malicious purposes. The challenge is to identify and fix these weak links when the international nuclear security system emphasizes national responsibility, has no binding obligations, and lacks effective mechanisms for transnational information exchange.

If the scope of nuclear security were limited only to fissile materials (plutonium and HEU), there may be some greater justification for maintaining a system that emphasizes the protection of security-related information. In fact, since most of the nuclear security regime is a product of the Cold War and the period after the September 11th terrorist attacks, it reflects an emphasis on information protection. But, the evolving definition of nuclear security and the Fukushima nuclear accident argue for a regime that provides for greater international confidence, while protecting sensitive information.

The challenge is to identify mechanisms that allow for this increase in international confidence in a way that balances the sovereign responsibility that nations have for their nuclear infrastructure and materials with the increasingly clear international impacts of unauthorized releases of radiation.

The example of nuclear safety is instructive in considering this challenge. Nuclear safety is widely considered to be a more advanced discipline than nuclear security, but some significant problems were recently revealed. In the wake of the Fukushima nuclear accident, the European Commission (EC) and the Tokyo Electric Power Company (TEPCO) released reports on the state of nuclear safety in their region and country, respectively.

The EC, while finding that no shutdown of nuclear power plants was necessary, concluded that nearly all European nuclear power plants required some level of safety upgrade and made recommendations for improving the uniformity of technical standards and safety review procedures. The Commission found “significant” differences in safety standards, regulations, and implementation across borders. In their view,

confidence in nuclear safety can be enhanced through greater harmonization and information sharing among European Union (EU) nations.

The TEPCO assessment is even starker. It highlights a culture of complacency in the utility (a phenomenon referred to as Japan's "safety myth" following Fukushima), including overconfidence in safety systems and expertise, unwillingness to implement safety upgrades for fear such action could feed public concerns about reactor safety and invite litigation, and the inability of regulators to effectively enforce safety upgrades. The recommended actions included organizational, work process, and information sharing reforms.

The results from these analyses can and should be applied to nuclear security as part of the process of creating a world with no exploitable weak links in its nuclear governance regimes. However, improvements in the global nuclear security regime should not have to wait for an incident comparable to the Fukushima nuclear accident. Neither the global economy, nor the global political system can afford an act of nuclear terrorism. Clearly, strengthening the nuclear security system will take time and should move on a continuum from the present system, to additional voluntary commitments, to a comprehensive international legal instrument with binding obligations.

There are five steps that should be taken to significantly strengthen global nuclear security and create a foundation that is effective and adaptive to changes in the threat posed by nuclear terrorism and other dangers. These are:

- Defining the scope of nuclear security
- Universalizing the current regime
- Adopting the principle of continuous improvement
- Addressing political challenges
- Creating a unifying instrument

These steps should be completed by 2020.

### **1. Defining the Scope of Nuclear Security**

As a first step toward improvement, it is important to clarify the definition and scope of nuclear security. The IAEA has been assisting countries with their nuclear security since the 1970s and is widely considered to be the foremost international authority on nuclear issues in many countries. At present, the IAEA defines nuclear security as "the prevention and detection of, and response to, theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities." The IAEA adopted this definition in late 2003, but the way the Agency approaches nuclear security, along with the threat, has evolved in several ways since then.

Since publishing its third and most recent *Nuclear Security Plan 2010-2013*, the IAEA has adapted its program to emerging issues in nuclear security including education, forensics, and cyber security, while increasingly discussing the complimentary nature of nuclear safety and security. In its newest version of the *Nuclear Security Fundamentals: Objective and Essential Elements of a State's Nuclear Security Regime* document, the IAEA includes facilities and activities associated with nuclear and other radioactive materials in the scope of nuclear security.



With both the IAEA and the NSS process emphasizing the multiple aspects of nuclear security, a comprehensive definition would include the security and safety of nuclear materials, radioactive sources, and nuclear facilities, including protection from terrorism, cyber attacks, or other malicious acts. Therefore, it seems that it is both outdated and insufficient to limit any definition of nuclear security to only fissile materials. This expansion of the scope makes the agenda more relevant to a growing number of countries that will be embarking on or expanding nuclear-related activities in the coming years and provides a compelling reason to continue the high-level focus on nuclear security.

## 2. Universalizing the Current Regime

A second step to substantial nuclear security improvement is to universalize the current regime so that all nations are adhering to the relevant international agreements and security recommendations. This is a major objective of the NSS process and reflects the fact that a nuclear security incident in one country will almost certainly affect its neighbors and have larger international ramifications. The first line of defense and primary responsibility for nuclear security resides with the country in which materials are manufactured or stored or to which they are transported. These materials are national possessions, and the laws and regulations of individual nations are the most relevant protections. Individual nations are very protective of this sovereign responsibility and generally provide little information regarding their laws and regulations governing nuclear security to the international community. International confidence in nuclear security, therefore, must rely on international instruments and assertions of adequate national nuclear security. Unfortunately, accession to, and compliance with, these instruments is inconsistent and difficult to confirm.

The current international nuclear security regime consists primarily of international conventions, bilateral and multilateral agreements, UN resolutions, and best practice recommendations. Also, the IAEA has numerous technical recommendations and services that are available to member states to help them improve nuclear security. These international obligations are largely voluntary. They contain no uniform requirements for implementation, no enforcement mechanisms, and no penalties for non-compliance. In addition, there is no consistency in the adoption of the elements of the regime by individual nations. For example, while the CPPNM has 148 parties, the amendment that extends its protections is not in force, having only been ratified by 64 of those nations.

To achieve the “no weak links” objective for nuclear security, all nations need to adopt and adhere to all elements of the current international nuclear security regime. There are roughly 55 separate components that nations could participate in or implement (see Appendix IV). But there is no single mechanism to gather information on whether any or all are taking advantage of them. The Nuclear Security Index, established by the Nuclear Threat Initiative, is nongovernmental initiative that has gathered data, from open-sources and governments, to provide an overview of the status of nuclear security in individual countries. However, in many cases requests for transparency about the state of nuclear security and the implementation of security measures in individual nations have been resisted. The sharing of this information was a central topic of discussion during negotiations of the amended CPPNM and in the more recent NSS process, but there has been little progress so far.

### *Developing a Checklist*

One way to address the opaqueness of the nuclear security system is to gather non-sensitive but useful information through a simple checklist of the elements of the regime that nations either participate in or implement. (A version of this checklist is provided in Appendix IV).



Checklists are increasingly used to cope with the volume and complexity of information that is a feature of many 21st century professions. A simple checklist of international agreements, multilateral initiatives, and voluntary efforts could provide a snapshot of the comprehensiveness of nuclear security in a country, identify areas where some improvement could be made, and also motivate the action for that improvement. In a number of industries, including the medical profession, checklists have led to higher baseline performance standards, which is exactly the objective in the nuclear security area.

The effective use of the checklist relies on the integrity of the nation utilizing it, and there may be some disincentive to sharing the checklist publicly (including the potential for revealing weaknesses). States could submit the documents to the IAEA with the same rules of confidentiality that exist in the areas of nuclear safety and safeguards. Under IAEA rules, the safety reports made by nations are confidential, but some nations elect to make them public. This could be an option if the IAEA was empowered by its member states to distribute and encourage the submission of the checklist.

If the checklist is adopted, there will be a concrete way to measure progress. This would be further strengthened by a consultation process to confirm the information in the checklists. As states gain experience with the checklist, they may be more comfortable with the submission of more detailed national reports. In addition to this type of reporting, there are other voluntary actions that could be undertaken and cultural changes that would need to be achieved to remove weak links in the nuclear security system.

### **3. Adopting the Principle of Continuous Improvement**

A third step toward a stronger nuclear security system is for all relevant stakeholders—governments, regulators, industry, international organizations, industry organizations, and civil society—to adopt the principle of continuous improvement. This would allow for improvements to be made over time and on a continuum. It would also allow for the continuous adoption of improved responses to new realities, threats, technologies, and political and regulatory objectives. Continuous improvement should begin with an assessment of the current state and then define objectives. The continuum of improvement moves from the current state to the end state and then re-evaluates and moves forward again. Such processes are consistent with widely accepted enterprise performance management theories employed by numerous industries.

Most nuclear enterprises, including the operation of reactors, the management of fissile materials, and the control of radioactive sources, are governed by rules put forth by national regulators. The tension between regulators and operators in the nuclear field (in most countries) has created a balance, particularly in the safety area, that allows for public confidence in safe operations. As in nuclear safety regulations, security rules for nuclear facilities that are based on the IAEA recommendations are performance-based. Addressing security for high-activity radioactive sources, however, tend to be prescriptive.

#### *Learning from Nuclear Safety*

Nuclear safety is not a perfect template for nuclear security, because as recent reports have indicated, existing safety standards are not being met everywhere all the time. But, the nuclear safety system has several significant features that apply to nuclear security. It is a system that many nuclear operators are familiar with; it is acknowledged as a necessary prerequisite for continued operation of reactors; and it is a more developed and transparent international regime than nuclear security. The successes and failures of the nuclear safety regime are applicable to nuclear security and much can be learned from both.

There are four elements of the nuclear safety regime that have direct applicability to nuclear security: regularized assessments, information sharing, peer review, and reviews of the implementation of relevant international conventions. These four elements are embodied in the Convention on Nuclear Safety (CNS) and have been critical to the improvement of nuclear safety over time. The nuclear security regime's key international conventions—the CPPNM and its amendment and the International Convention for the Suppression of Act of Nuclear Terrorism (ICSANT)—do not include provisions for assessment or peer review.

While ICSANT includes a mechanism for states to submit amendments to be considered by the parties, it does not include a mandatory periodic review conference. The CPPNM has held one review conference and one amendment conference, as required by Article 16. Two-thirds of the CPPNM parties amended the scope of the Convention in 2005. The amendment's provisions will not enter into force until two-thirds of states parties ratify the changes. However, the Amendment has influenced new IAEA standards, guidance, and human resource development recommendations.

Also, the nuclear industry created strong organizations, such as the Institute of Nuclear Power Operators and World Association of Nuclear Operators, to facilitate domestic and international peer review of nuclear reactor safety. Facilitating information sharing in the nuclear security area is one of the most important paths to improving the regime, and these industry-led efforts have made progress in this area that could be replicated in the security arena. In this respect, WINS launched in 2008, is an important new addition focused on sharing and promoting nuclear security best practices, particularly its focus on better integrating security into nuclear facility operations.

In addition, it is very important to recognize what nuclear security can and should learn from the failings in the nuclear safety area, most recently highlighted by the EC and TEPCO reports. Here it is clear that the fear of public reaction, a lax culture, discontinuity between rules and regulations, and lack of regulatory independence and aggressive oversight are all pitfalls that the nuclear security regime should avoid, and, if they exist, address.

### *Emphasize Incentives*

Another approach to implementing continuous improvement in nuclear security is to identify and utilize incentives. Many industries that have public service and public safety obligations supplement their legal and regulatory responsibilities by voluntarily accepting additional requirements. These include industries in the health, environment, finance, aviation, and utility areas. The incentives can be placed in three basic categories - accreditation and certification, financial benefit (aid, tax credits, profit enhancement, cost savings), and reputational enhancement.

The voluntary regimes used in these other industries can serve as models for a medium-term evolution of nuclear security governance because they provide a pathway to developing new norms. Industries that voluntarily adopt higher standards than legally required, or institute best practices to ensure high performance, often see these changes become institutionalized over time and applicable to the entire industry. In this respect, countries that have the means and established best practices should share them with nations in need of support to improve their nuclear security practices. Efforts to improve global nuclear security will be made easier and the results more durable if voluntary, self-imposed actions lead to the ultimate adoption of a binding and comprehensive legal instrument.

#### 4. Addressing Political Challenges

Since the major challenges to improving nuclear security are not technical, it is important to identify the political and cultural impediments that exist and identify approaches that can address them. The resistance to significantly improving the nuclear security system is driven by a number of factors. These include old conflicts over nonproliferation and disarmament, worries about the erosion of sovereignty and security of sensitive information, concerns about the financial and personnel costs of expanding beyond current obligations, and an aversion to creating new and expansive bureaucracies. These concerns are legitimate, but they also can be addressed with the application of innovation, political will, and incentives.

##### *Transcending the Politics of the Nuclear Non-Proliferation Treaty (NPT) and Nuclear Terrorism*

As the international political profile of nuclear security has risen, there has been a backlash against it among some countries, particularly in the developing world. This stems from both a perception gap regarding the seriousness of the threat of nuclear terrorism and the decades old politics surrounding the NPT. There are two main lines of argument. One is that the threat of nuclear terrorism is primarily faced by nuclear weapon states that possess military fissile materials. The other is that the non-nuclear weapon states should not accept any new responsibilities and possible limits on their nuclear activities beyond those provided for under the NPT.

These perspectives have inhibited the Nuclear Security Summits from being more aggressive in their objectives as the consensus that is required for the official communiqués tends to reward those that seek the least amount of change. But in a world with a globalized economy and a variety of other interdependencies, the position that only developed and nuclear weapon-possessing states have to be concerned with improved nuclear security is rapidly losing whatever credibility it may have had in the past.

There are civilian nuclear reactors in some non-nuclear weapon states that use HEU that could be attractive to nuclear terrorists. In addition, the definition of nuclear security transcends fissile materials and includes nuclear facility security and radioactive sources. Radioactive sources reside in virtually every country around the world for medical and industrial purposes. Sabotage against a nuclear reactor or the explosion of a dirty bomb using high-activity radioactive sources could be carried out by terrorists in any number of countries. And, in a world of globalized commerce, dangerous materials and components can be transported far and wide. The economic impact of any act of nuclear terrorism will be significant, and it will affect export-dependent developing nations as well as the developed world; in fact, such an event may have the greatest effect on those states that can least afford it.

There is no reason for the nuclear security issue to be consumed by the politics surrounding the NPT. The nuclear security issue should be one where the emphasis is on responsibility not resentments. All states should have nuclear security obligations, not just some; and all nuclear and other radioactive material should be secured to agreed standards. An enhanced, weak-link-free nuclear security system would not require the creation of a new institution or add costly new burdens on states. The central technical and consensus-building roles of the IAEA appeal to many nations and will remain part of a strengthened and integrated nuclear security regime. But a multilateral political track on which governments can innovate and take initiative alone or in groups is valuable and should be maintained.

### *Streamlining the Regime's Components*

One way to bolster the value of improved nuclear security among skeptical nations is to streamline the elements of the current regime where possible. All programs and initiatives should be carefully analyzed so that overlaps, duplications, and inefficiencies can be eliminated. There are three basic categories of activities today: UN, IAEA, and ad hoc mechanisms. These cover security of materials at their source, security in transit, material disposition, security culture, legal requirements, and emergency response. Together they amount to 15 separate agreements, programs, initiatives, and processes that need to be accounted for—and staffed—by governments. For smaller countries with limited resources and personnel, this can be a significant burden and inhibits compliance.

Most of these elements were created not as part of a strategic plan for seamless nuclear security but in response to opportunity or urgency. Disentangling the overlap will not be an easy task, but it could be an important step in moving the nuclear security regime towards coherence and continuity for the future. As part of the rationalization of the regime, the future roles of the IAEA and the NSS process need to be addressed.

### *Empowering the IAEA*

The IAEA plays a central role in supporting effective nuclear security. However, the IAEA primarily produces recommendations and encourages states to take action on nuclear security matters. At present, it has no statutory mandate to evaluate state performance in implementing or complying with its recommendations.

The most developed set of recommendations and guidance that the IAEA offers on the physical protection of nuclear materials and facilities can be found in Information Circular 225/Revision 5 (INFCIRC 225). The fifth revision of INFCIRC 225 was released in early 2011. It addresses the post-September 11th threat environment, as the previous revision was completed in 1999. The most recent version updates categorizations of nuclear material and clarifies site access and control areas. Other changes involve new licensing requirements, prevention of sabotage, interface with safety, interface with material accounting and control systems, and response to a malicious act.

The IAEA also has an Office of Nuclear Security with several responsibilities. It plays the leading role in planning, implementing, and evaluating the Agency's nuclear security activities. It also produces the Nuclear Security Series (consisting of 17 documents published to date) and manages the NSF which is used to support efforts that prevent, detect, and respond to nuclear terrorism. This fund is largely reliant upon extra-budgetary contributions from member states, though it receives some limited funding from the regular IAEA budget.

In addition to the documents that the IAEA produces, member states can augment their domestic security protections by seeking in-country assistance. The IAEA's nuclear security advisory services include: International Nuclear Security Advisory Service missions which help identify a country's broad nuclear security requirements and measures for meeting them, International Physical Protection Advisory Service (IPPAS) missions which evaluate a country's existing physical protection arrangements and legal and regulatory structure, and IAEA State Systems for Accountancy and Control Advisory Services which provides recommendations for improving a country's nuclear material accountancy and control systems.

With all of these useful and detailed products and services, the IAEA is indispensable and irreplaceable. But, its capacity and power are constrained by the voluntary nature of its recommendations, its primarily consensus-based decision making, and its budget. Without doubt, the IAEA will remain at the center of the nuclear security agenda as a deep repository of expertise and continue to serve the very important function of achieving universality in the decisions and recommendations it produces. However, as an international organization it does not and cannot have a monopoly on a dynamic nuclear security agenda, particularly if its member states do not provide it with greater power, latitude, and funding. Nation states must provide political leadership in this area. There is an important requirement for a separate political track that should include a role for the IAEA, is flexible, allows for greater policy innovation, is not bound by consensus and universality among the parties, and includes all stakeholders.

### *Maintaining the Political Momentum of the NSS*

For the past four years the NSS process has been the parallel political track alongside the IAEA. Beyond addressing technical aspects of nuclear security, the NSS has provided several important political benefits. Heads-of-state level participation in the NSS has raised the international political profile of the nuclear security issue. It has committed more than 50 nations to the fight against nuclear terrorism and the strengthening of the current nuclear security regime. And, it has provided the opportunity for nations, alone or in groups, to offer and take actions that move beyond the limited legal requirements of the regime. Such political attention and momentum did not exist before 2010 and likely will not continue if the NSS process ends after the 2014 summit and a credible successor process is not identified.

Beyond the formal governmental summit, the NSS provides the opportunity for the nuclear energy industry and nongovernmental organizations to convene their own satellite events around the NSS. These events have strengthened these international stakeholder communities and deepened their involvement in the issue. A new example of cooperation among stakeholder groups was the first ever international regulatory conference, convened in December 2012.

If a NSS-like process is not sustained after 2014, then the centrifugal force that it has exerted in binding all the stakeholder communities to the nuclear security agenda could decrease, and it is likely the nuclear security agenda will drift down the international list of priorities. This would be a problem because the nuclear security regime still has weak links that need to be addressed if the international community is to succeed in preventing, rather than in responding to, nuclear terrorism. A post-NSS political forum could take many different forms, but the continuation of a political forum for nuclear security, along with the other stakeholder fora, is important for future progress. At the 2014 NSS, a gift basket should be offered by participating nations that sets the stage for the continued evolution of the nuclear security governance system no matter what happens with the NSS (see Appendix II).

### *Issuing a Statement of Principles*

In addition, it is important to expand the reach of the NSS or its successor process beyond current participants. To do this, a statement of principles open to signature by all states could be issued (see Appendix I). It could take the form of an annex to the 2014 communiqué or a gift basket. This statement would be a political document and would counter criticisms about NSS selectiveness. This way, it could become a document that outlives the process, involves all sector stakeholders, and allows those stakeholders to continue innovating on the issue. This could ultimately become the core of an international framework convention for nuclear security.

## 5. Creating a Unifying Instrument

If the process of continuous improvement in nuclear security is to be achieved over time on a continuum from its current state through a period of more aggressive unilateral and multilateral voluntary actions, then it needs to result in a more permanent, cohesive, and comprehensive international instrument for the nuclear security regime by 2020.

A framework agreement for nuclear security is one approach that could meet this objective of creating a regime unifying international instrument. The instrument could include a number of items and usefully package them so that its norms are unified, clear, and cohesive. For example, it could:

- Include a comprehensive and convincing assessment of the nuclear terrorist threat, including the global economic consequences of a nuclear or radiological terrorist event.
- Underscore that security systems have to evolve to meet the changing threats and that sovereignty must coexist with international responsibility.
- Recognize that effective nuclear security is essential for increased uses of nuclear energy.
- Recognize all the relevant existing conventions, agreements, and UNSC resolutions and state that universal acceptance of these agreements and their rigorous implementation are fundamental for effective and sustainable nuclear security.
- Recognize the importance of the IAEA in all areas of nuclear security and endorse greater international political and financial support for its activities.
- Clearly establish the legitimacy of ad hoc mechanisms such as the Cooperative Threat Reduction (CTR) program, the G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction, the GICNT, and others while proposing that these initiatives be streamlined and folded together to increase efficiency. It could encourage all nations that can contribute to the objective of these efforts, or benefit from them, to become participants.
- Make clear the need for continued robust multilateral funding over the long term for those nations and institutions in need of assistance to improve nuclear security, including through the IAEA, and to fulfill international obligations, such as UNSC Resolution 1540.
- Recognize that excess fissile materials should be permanently disposed of, and that storage of all nuclear materials should be consolidated to the degree possible consistent with safety requirements.
- Encourage implementation of the highest possible security standards and the utilization of an intensive process of global best practices and security culture engagement.
- Underscore the need for a balance between voluntary and mandatory security commitments, standards, and practices.



- Identify the need for a baseline standard for nuclear and radioactive material security to supplement the current voluntary requirements and guidelines—one that while measurable and transparent, does not compromise sensitive information.
- Encourage public-private partnerships in support of nuclear security and recognize the important role that the nuclear industry and civil society play in this area.
- Allow for the negotiation of supplementary protocols that require more detailed nuclear security actions. The protocols could specify actions to be taken by individual nations, identify or reference standards for security, create a scientific council, detail means of sharing information for peer review on a confidential basis, identify dates for completion of specific security actions and improvements, and establish enhanced authority for the IAEA. It should also include an amendment process and a regularized review conference.
- Include an annex through which nations can make additional commitments for nuclear security improvement on a unilateral or multilateral basis.

Framework agreements addressing transnational challenges, such as nuclear security, have successful precedents, particularly in the environmental area. Legally, framework agreements are designed to unify a “special regime” that consists of elements that are binding but fragmentary. They also give international obligations a rooting in international law. Models for the framework agreement on nuclear security include the Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol, the UN Framework Convention on Climate Change and the Kyoto Protocol, and the CNS. A framework agreement for nuclear security should eventually be universal, but its development could begin with support from a coalition of committed nations.

The suggestion of a unifying instrument has drawn skeptical responses from some countries involved in the NSS process. They argue such an agreement exceeds the mandate of the summit and may commit them to obligations beyond the current regime. However, this instrument does not need to be tied to the NSS process, although it is an obvious place to launch a process to negotiate such an instrument. A framework agreement would:

- Strengthen, integrate, and codify the legal grounding of the disparate elements of the regime
- Not create a new bureaucracy, since the secretariat and assistance functions could be carried out by the IAEA
- Take advantage of some of the innovations that the NSS instituted and help streamline the current regime to reduce bureaucratic burdens
- Provide an ongoing forum to address nuclear security issues, including at a senior political level

### Key Issues and Recommendations

The vision and goals for a stronger and more effective nuclear security regime are long-term. The five steps detailed above will require coordination over time to be achieved. The Nuclear Security Governance Experts Group (NSGEG) convened three international workshops in 2012 to develop practical, near- and medium-term recommendations that lay the groundwork for the group’s more long-term aspirations.



The following 30 recommendations are broken into three major categories: improving regime cohesion, promoting greater transparency, and building international confidence. These recommendations represent actionable, practical steps that can be taken by states and groups of states committed to improving global nuclear security. Each is related to and enforces the broader goals of one or more of the five steps above. They were drawn from discussions at the NSGEG workshop series, where each topic was addressed individually and papers were commissioned to analyze the key issues in each topic area. For further information on the workshop agendas, participants, and papers, please see Appendix VI.

### **Improving Regime Cohesion**

*Recommendation 1:* Endorse a long-term vision for the improvement of the global nuclear security system that includes universalization of the current regime, sustained political attention, and an eventual framework agreement that codifies the regime.

*Recommendation 2:* Analyze the current nuclear security regime to identify specific and significant gaps, limitations, overlaps, duplications, and inefficiencies that can be eliminated.

*Recommendation 3:* Identify and apply lessons learned from other nuclear regimes that can fill the gaps in the nuclear security regime and begin bringing the global nuclear governance system into better alignment. The interface between nuclear safety and security is one area that needs to be further explored, especially as it relates to systematic assessments, regularized reporting, and peer review.

*Recommendation 4:* Incentivize states to share and implement global best practices for nuclear security at the national, regional, international, and facility levels. Encourage states to implement the amendment to the CPPNM on a voluntary basis pending its formal entry into force.

*Recommendation 5:* Develop a long-term nuclear security reporting structure for countries that includes reporting on 1) fissile materials, 2) high-activity radioactive materials, 3) nuclear facilities, 4) spent fuel and nuclear waste, 5) illicit trafficking and transshipment, and 6) mitigation and emergency response mechanisms.

*Recommendation 6:* Assess the best methods for building a unified and durable nuclear governance regime, including a unifying instrument on nuclear security.

### **Promoting Greater Transparency**

*Recommendation 7:* Bring nuclear safety, security, and safeguards experts together to identify what information is shared by operators, regulators, and states in each of these disciplines. Have them assess the benefits of information sharing and peer review. Then, identify what nuclear security-related information can and should be shared more broadly (specifying with whom and for what purpose) and what barriers hinder these exchanges. Within the IAEA, explore ways in which its safeguards and safety missions can generate and share information on security.

*Recommendation 8:* Assess the role that the nuclear industry can play in sharing experiences and best practices across borders on nuclear security, without compromising commercial or classified information. Evaluate the potential for operators to request IPPAS assessments of their facilities and develop a process

for them to do so. Assess the value of creating a forum where nuclear exporters can discuss their reasoning for supplying or denying nuclear exports to particular clients based on security concerns so that all exporters are informed of any security-related risks or assurances that individual exporters discover.

*Recommendation 9:* Utilize the nuclear security centers of excellence to support information sharing to assist global nuclear security improvement. This can include the development of model or simulated facilities to test transparency and security concepts and the creation of a group of expert security practices peer reviewers trained on IPPAS mission processes.

*Recommendation 10:* Review regional organizations that exchange nuclear information, like the European Nuclear Security Regulators Association, Euratom, and the Argentine-Brazilian Agency for Accounting and Control (ABACC), and determine how their procedures could be adapted to nuclear security information sharing on a broader regional basis.

*Recommendation 11:* Survey existing incentives regimes used in other industrial fields and professional sectors to determine what elements and approaches may be successfully adapted to a voluntary incentives regime for improving nuclear security performance.

*Recommendation 12:* Explore creating qualification and accreditation programs for nuclear security professionals and facilities, in industry and in public and private educational institutions, that are based on IAEA, WINS, and related recommendations to introduce stronger performance standards and recognize professional achievement.

*Recommendation 13:* Evaluate the benefits of including nuclear security certifications as part of national nuclear security regulations.

*Recommendation 14:* Study existing methods for the protection of confidential and sensitive information such as those of NATO, IAEA, CTR, and intelligence sharing.

*Recommendation 15:* Continue to convene national regulators annually to allow for international interaction and best practice exchange to improve the performance of their national regulatory systems and to assess methods by which regulatory information exchanges can be instituted across borders. (The first of these meetings occurred in December 2012 in Washington.)

*Recommendation 16:* Encourage nuclear operators to assess the value and modalities by which they could begin to share information on nuclear security related to the facilities that they operate while allowing for the protection of sensitive information.

*Recommendation 17:* Convene regular interdisciplinary meetings of government officials, industry representatives, nuclear regulators, and nuclear security experts to foster stronger cooperation among responsible actors and promote better communication. The first should be held before the 2014 NSS.

*Recommendation 18:* Encourage the key stakeholders—governments, regulators, industry, international organizations, industry organizations, and civil society—to issue a joint statement in support of key steps to improve global nuclear security.

## Building International Confidence

*Recommendation 19:* Develop a global nuclear security regime checklist that identifies the relevant treaties, resolutions, international agreements, IAEA recommendations, services and programs, and related institutions. The checklist should provide a clear explanation of what countries should be doing to fully implement the current nuclear security regime. Ask states to check off the items that they employ in their national nuclear security system. This will serve as a non-intrusive, self-assessment tool and provide a baseline of understanding about the utilization of the existing regime elements without any need to share sensitive information.

*Recommendation 20:* Institute a culture of continuous improvement in the nuclear security regime by learning from other sectors and using voluntary incentive programs to improve performance. The successes and failures of other fields' attempts to address cultural challenges should be investigated, as well as potential accreditation and reputational and financial benefits that could be adapted to the nuclear security regime to incentivize progress.

*Recommendation 21:* Create a matrix that breaks down the nuclear security regime into functional categories and initiatives as a first step toward identifying how best to streamline the current array of nuclear security programs. The objective is to make the international system more efficient, less burdensome, and more cohesive.

*Recommendation 22:* Raise the priority of radioactive source security in the global community. High-activity radioactive sources are found in virtually every nation and the threat of a terrorist act utilizing radioactive material is considered by many nations to be a higher probability than one utilizing fissile material. Raising the radiological profile can also help to expand the number of nations that become more involved in nuclear security improvements.

*Recommendation 23:* Analyze how the global community has organized itself to address transnational threats outside of nuclear terrorism. The focus should be on lessons that can be learned and approaches and mechanisms that can be applied in the nuclear security area.

*Recommendation 24:* Conduct an analysis of the economic impacts of radiological and nuclear terrorism. While the threat of nuclear terrorism is an abstract threat for many nations, the economic impacts and political reverberations will be global.

*Recommendation 25:* Encourage all nuclear security centers of excellence to include policy as a focus of their work. Regionally-focused centers with technical and policy elements can assist with the coordination of national efforts and regional initiatives and link them to international goals.

*Recommendation 26:* If the 2014 NSS is the last, then an appropriate and effective replacement for the summit process needs to be instituted. Continuing high-level political focus on the nuclear security issue is vital for its further evolution. There needs to be a mechanism through which nations can continue to make unilateral and multilateral commitments to improve nuclear security similar to the "house gifts" and "gift baskets" that have been offered at the summits.

*Recommendation 27:* Encourage committed countries to take leadership roles by demonstrating improved nuclear security governance models, including at the regional level. Continue to support the NSS precedents and encourage regional leaders to commit to host events and work with like-minded states on ambitious nuclear security projects.

*Recommendation 28:* Encourage IAEA member states to provide greater funding and flexibility to the Agency to allow it to perform its nuclear security mission. Explore new sources and means of funding the NSF. In addition, encourage the IAEA to offer its advisory missions to a number of states each year, rather than waiting for them to be requested. States would be free to accept or decline the IAEA's services.

*Recommendation 29:* Define success in achieving significant global nuclear security improvement and explain whether the NSS process has accomplished these objectives. If the 2014 summit is the last, participant countries should be prepared to describe the concrete achievements and structural changes that make additional summits unnecessary.

*Recommendation 30:* Engage early and frequently with media and provide the context necessary for them to raise awareness in the public about the importance of nuclear security. Use nuclear security-related exercises, workshops, and meetings to demonstrate nuclear security principles in action and to promote understanding.

### Conclusion and Next Steps

The nuclear security regime lacks rigor, integration, transparency, and a mechanism for sustained political attention. In its current state, it is clearly not sufficient to address 21st century challenges. The NSGEG is committed to driving the nuclear security agenda forward, working to achieve greater global nuclear security by defining long-term objectives, and advocating for short- and medium-term practical actions and innovative policy solutions that can turn these goals into realities. The members of the NSGEG believe the recommendations in this report should be considered by all nations and particularly by the nations participating in the 2014 NSS in the Netherlands. In the group's view, the Netherlands summit will be a success only if it achieves the following:

- A commitment to a sustained political process on global nuclear security improvement that involves key stakeholders. If the NSS is not continued, any new process should provide opportunities for high-level political engagement, an agenda with the broad scope needed to address 21st century nuclear security issues, and participation by all key stakeholders, including the nuclear energy industry and expert community.
- The development of an agreement on the importance of information sharing across borders as a fundamental means of improving global confidence in nuclear security.
- Recognition of the need for a unifying instrument for the global nuclear security regime, followed by a process to develop and negotiate a framework agreement for nuclear security with the goal of entry into force by 2020.

The NSGEG is a resource for, and willing partner with, all nuclear security stakeholders that are committed to the significant improvement of the current regime. The group is willing to collaborate with these parties to see that its recommendations—and those proposed by others—are accepted and implemented effectively.

The NSGEG will launch a campaign in support of its vision and these recommendations. Its initial focus will be on achieving more substantial progress in all three of the key substantive areas it has outlined—regime cohesion, transparency, and international confidence—at the 2014 Netherlands NSS. The group will continue to convene substantive workshops on the key issues, communicate with all relevant stakeholders, and further research responses to regime gaps and problems. In this regard, the NSGEG may further refine and expand upon the recommendations and appendices contained in this report. All current and future publications can be found at [www.nsggeg.org](http://www.nsggeg.org). Its commitment to the substantial improvement of nuclear security governance and the prevention of nuclear terrorism is deep and long-lasting.

## Appendices

- I. Nuclear Security Principles for the 21st Century
- II. A 2014 Global Nuclear Security Governance Gift Basket
- III. Nuclear Security Summit Achievements by Category
- IV. Nuclear Security Governance Checklist
- V. Selected Nuclear Security Documents and Related Information
- VI. NSGEG Workshops, Members, and Organizational Information

## APPENDIX I: Nuclear Security Principles for the 21st Century

The policy objective of the Nuclear Security Summits should be captured in a clear statement of principles that NSS-participating nations and all other nations could sign on to. These principles could include the following:

- Nuclear power and technology are vital energy and human resources and the benefits of nuclear power, medicine, and other peaceful uses of atomic energy must be protected.
- Nuclear security should be continuously reviewed and improved on a national and international basis. The goal is a regime based on continuous improvement.
- All necessary steps to prevent nuclear terrorism using fissile materials and high-activity radioactive sources should be taken by all nations possessing them. Weak links in the system should be corrected and strengthened.
- All necessary steps should be taken to prevent the unauthorized, non-remedial release of radiation from nuclear reactors and other nuclear facilities by all nations possessing them.
- Efforts to achieve the highest levels of nuclear security should begin by maximizing the value of existing mechanisms and institutions. They should then extend to include additional voluntary measures that can be taken by individual nations or on a multilateral and regional basis. This should ultimately result in codified nuclear security standards, leaving to states the choice of the most appropriate tools that will allow them to meet these objectives.
- Nuclear safety and security are interrelated endeavors and all elements of these regimes should be reviewed and improved on a regular basis on both the national and international levels.
- The benefits to the nuclear safety regime of regular assessments, reporting of results, and peer review are relevant for the improvement of the nuclear security regime and should be applied to it.
- Any improvement in the nuclear security regime will have to balance the principles of sovereignty with international responsibilities and obligations.
- The nuclear security governance system should embrace a culture of continuous and confirmed performance.
- The stakeholder communities—governments, regulators, industry, international organizations, industry organizations, and civil society—should all be valued, encouraged to contribute and cooperate, and be treated equally in ensuring the safety and security of nuclear facilities and materials.
- Personnel with nuclear security responsibilities will be demonstrably competent and have received certified training where appropriate.

## APPENDIX II: A 2014 Global Nuclear Security Governance Gift Basket

Gift baskets, or multilateral voluntary pledges of nuclear security improvements, were a new addition to the 2012 Nuclear Security Summit (NSS) in Seoul. The 12 gift baskets offered at the 2012 NSS did not employ a uniform content formula, outcome requirement, or membership prerequisite. The most widely supported basket included 31 countries while two baskets included as few as three countries. One gift basket even allowed countries to sign on to some but not all of its pledges. Among the 12 gift baskets, the model used for the Joint Statement on Transport Security may be the most adaptable to a nuclear security governance action plan.

This gift basket has four important components.

- Reaffirmation of relevant Seoul or Washington communiqué or work plan commitments
- Recollection of why nuclear security is important and deserves special treatment
- Description of the state of play with efforts to address the nuclear terrorism threat
- Explanation of what the gift basket aims to do, including any timetables and products
- This gift basket could also be supplemented with additional commitments made by the nuclear industry and civil society.

### Draft Text: Nuclear Security Governance Gift Basket

At the 2010 Washington Nuclear Security Summit, all participants agreed that “nuclear terrorism is one of the most challenging threats to international security” and addressing the threat “will require responsible national actions and sustained and effective international cooperation.”

At the 2012 Seoul Nuclear Security Summit, all participants reaffirmed the challenge that nuclear terrorism poses and renewed their political commitments to strengthen global nuclear security to combat it. Leaders further stressed “the importance of regional and international cooperation, and encourage[d] States to promote cooperation with and outreach activities to international partners.”

These summits, the Fukushima accident of March 2011, and high-level meetings on nuclear safety and security convened by the United Nations and its agencies have highlighted the importance of global nuclear security governance. The current architecture has evolved and been strengthened in important and useful ways over the past decade, but gaps persist.

On the occasion of the 2014 Netherlands Nuclear Security Summit, we, the governments of [countries] express our commitment to build on the foundation of success and cooperation established by the previous summits to initiate strengthened and integrated nuclear security governance architecture in the following ways:

1. Participating countries in this basket will hold working group meetings among government officials and other relevant experts from international organizations, the private sector, and nongovernmental community on the need to build a stronger more unified global regime for the protection of fissile materials, high-activity radioactive materials, and key nuclear facilities for:



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- a. Promoting transparency of action
  - b. Improving cohesion and standards
  - c. Building international confidence and responsibilities
2. The first working group meeting will be held in [country] by [year].
  3. Participating countries in this basket may consider organizing additional workshops, dialogues, and other events to help better understand and strengthen global nuclear security governance structures.
  4. Based upon these interactions, a proposal will be submitted to/at [next NSS or successor event or other], which will contribute to the continuous process of strengthening global nuclear security governance.
  5. Participating countries in this basket will explore the process for developing a unifying instrument for the global nuclear security regime, followed by a process to develop and negotiate a framework agreement for nuclear security with the goal of entry into force by 2020.

## APPENDIX III: Nuclear Security Summit Achievements by Category

### Nuclear and Radioactive Materials

States executed nuclear material removals, consolidations, and highly-enriched uranium (HEU) reactor conversions. Sweden cleaned out all of its separated plutonium. Ten states removed all of their weapons-usable material, and a total of 3,000 nuclear weapons worth of HEU has been downblended to low-enriched uranium (LEU) in Russia and the United States since 2009. HEU reactor conversions have been completed in the Czech Republic, Mexico, and Vietnam and more are in progress. At the Seoul summit, four countries announced a joint initiative to develop high-density LEU fuel to replace HEU in high performance research reactors, and three countries announced plans convert European production of medical isotopes to non-HEU process by 2015. A joint statement on radioactive source security drew support from 23 countries.

### International Instruments and Initiatives

The Convention for the Physical Protection of Nuclear Material (CPPNM) and the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT) provide the foundation of today's global nuclear security regime. Since the 2010 summit, 31 additional countries have ratified the amended CPPNM, and 19 new states have ratified ICSANT. The summits' attention to these treaties has encouraged states inside and outside the process to ratify them— 18 of the new adherents to these international instruments did not participate in the summit.

With the help of the summit process, there are now 82 members of the Global Initiative to Combat Nuclear Terrorism, and 24 members of the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction. New countries have joined the U.S.-led Megaports Initiative, and additional financial and in-kind support has been pledged to the United Nations Security Council Resolution 1540 Committee, the World Institute for Nuclear Security, and national programs directing cooperative threat reduction work.

### Technical Cooperation and Security Culture

The summit process emphasizes the central role that the International Atomic Energy Agency (IAEA) plays in nuclear security and works to garner additional support for its activities. NSS participants pledged millions in additional financial support to IAEA's Nuclear Security Fund. Four countries have received IAEA's International Physical Protection Advisory Service (IPPAS) missions, and five states plan to welcome IPPAS missions before the next summit.

The summit process also encouraged the growth of national and regional nuclear security centers of excellence (CoE) that will serve as technical resources, training facilities, and opportunities for information sharing. Approximately a half dozen countries have established CoE and ten others have plans to set up centers in the future. In addition to the CoE, which will be permanent institutions, the NSS process has encouraged several states to host technical conferences, training sessions, and table top exercise focused on nuclear security. The United States hosted the first-ever international regulators conference on nuclear security in 2012.

### **Counter Smuggling**

The summit has also been the source of a number of joint initiatives aimed at improving the security of radioactive sources and countering nuclear smuggling. South Korea and Vietnam, along with the IAEA, are developing a system to track radioactive materials using GPS in the hopes of minimizing the risk of theft. Jordan organized a joint statement on countering nuclear smuggling that drew support from nearly 20 states. Since the first NSS, two countries passed new export control laws and several more pledged to update their national nuclear regulatory systems. Singapore became the newest participant in the IAEA's Illicit Trafficking Database just before the Seoul summit, bringing the number of summit participating countries involved in it to 51.

## APPENDIX IV: Nuclear Security Governance Checklist

The global nuclear security regime has many diverse elements. Please indicate in which of the following you participate.

1. Indicate which of the following <b>treaties, resolutions, and international</b> agreements you are a member of, a party to, a signatory of, or implementing:	
International Convention for the Suppression of Nuclear Terrorism	
UNSC Resolution 1540	
UNSC Resolution 1373	
Convention for the Physical Protection of Nuclear Material (CPPNM)	
2005 CPPNM Amendment	
Code of Conduct on the Safety and Security of Radioactive Sources	
Supplementary Guidance on the Import and Export of Radioactive Sources	
IAEA Safeguards Agreement	
IAEA Additional Protocol	

2. The <b>IAEA Nuclear Security Series</b> is intended to be an implementing guideline for countries to enter into compliance with one or more of the above agreements. Indicate which of the Series documents you are implementing:	
Nuclear Security Fundamentals: Objectives and Essential Elements for a State's Nuclear Security Regime	
Recommendations	Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC 225/Rev. 5)
	Nuclear Security Recommendations on Radioactive Material and Associated Facilities
	Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control
Implementing	Nuclear Security Culture
	Preventive and Protective Measures against Insider Threats
	Security in Transport of Radioactive Material
	Development, Use, and Maintenance of the Design Basis Threat
	Security of Radioactive Sources
Technical	Nuclear Forensic Support
	Monitoring for Radioactive Material in International Mail Transported by Public Postal Operators
	Engineering Safety Aspects of the Protection of Nuclear Power Plants against Sabotage
	Identification of Radioactive Sources and Devices
	Combating Illicit Trafficking in Nuclear and other Radioactive Material
	Education Programme in Nuclear Security
	Computer Security at Nuclear Facilities
Nuclear Security Systems and Measures for Major Public Events	

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3. The <b>IAEA Nuclear Security Fundamentals</b> include 12 essential elements of a nuclear security program. Indicate whether you are adhering to the following elements:	
State Responsibility	
Identification and Definition of Nuclear Security Responsibilities	
Legislative and Regulatory Framework	
International Transport of Nuclear Material and Other Radioactive Material	
Offenses and Penalties Including Criminalization	
International Cooperation and Assistance	
Identification and Assessment of Nuclear Security Threats	
Identification and Assessment of Targets and Potential Consequences	
Use of Risk-Informed Approaches	
Detection of Nuclear Security Events	
Planning for, Preparedness for, and Response to a Nuclear Security Event	
Sustaining a Nuclear Security Regime	

4. Have you taken advantage of or participated in the following <b>IAEA services and programs</b> :	
International Nuclear Security Advisory Services	
International Physical Protection Advisory Services	
Integrated Nuclear Security Support Plans	
State System of Accounting and Control Advisory Services	
Integrated Regulatory Review Services	
Incident and Trafficking Database	
Nuclear Security Information Portals	
Training Courses, Seminars, and Workshops	
Master of Science and Certificate Programs	
International Nuclear Security Education Network	
Nuclear Security Support Centers	

5. Indicate which of the following <b>mechanisms</b> you participate in or contribute to:	
Global Initiative to Combat Nuclear Terrorism	
G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction	
Centers of Excellence (national, regional, or other)	
Nuclear Security Summits	
Proliferation Security Initiative	
World Institute of Nuclear Security	
IAEA Nuclear Security Fund	
U.S. international nuclear security programs (please specify)	

## APPENDIX V: Selected Nuclear Security Documents and Related Information

### Multilateral Agreements

- Convention on the Physical Protection of Nuclear Material (CPPNM) and 2005 Amendment
- International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT)
- United Nations Security Council (UNSC) Resolution 1540 and 1540 Committee
- UNSC Resolution 1373
- UNSC Resolution 1887
- Code of Conduct on the Safety and Security of Radioactive Sources

### IAEA Documents

#### *Nuclear Security Series*

- Fundamentals of State's Nuclear Security Regime: Objective and Essential Elements
- Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC 225/Rev. 5)
- Nuclear Security Recommendations on Radioactive Material and Associated Facilities
- Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control
- Nuclear Forensic Support
- Monitoring for Radioactive Material in International Mail Transported by Public Postal Operators
- Engineering Safety Aspects of the Protection of Nuclear Power Plants against Sabotage
- Identification of Radioactive Sources and Devices
- Combating Illicit Trafficking in Nuclear and other Radioactive Material
- Education Programme in Nuclear Security
- Computer Security at Nuclear Facilities
- Nuclear Security Culture
- Preventive and Protective Measures against Insider Threats
- Security in Transport of Radioactive Material
- Development, Use and Maintenance of the Design Basis Threat
- Security of Radioactive Sources

#### *International Law Series*

- Amendment to the Convention on the Physical Protection of Nuclear Material
- International Legal Framework for Nuclear Security

### Nuclear Security Summit Documents

- 2010 Washington Nuclear Security Summit Documents
- 2012 Seoul Nuclear Security Summit Documents

## APPENDIX VI: NSGEG Workshops and Related Materials

### Improving Nuclear Security Regime Cohesion

*Seoul, South Korea – July 2012 | Agenda*

The Value of Universalizing the Current Regime by John Bernhard

Strengthening the Nuclear Security Regime: Lessons from the Global Framework Agreements on Ozone and Climate Change by Kenneth Brill

Value of Using Nuclear Cooperation Agreements and Euratom as Vehicles for Instituting Peer Reviews and Uniform Security Standards by Caroline Jorant

The IAEA and Nuclear Security by Trevor Findlay

The Development of the Supporting Infrastructure for Improved Nuclear and Radioactive Material Security by Steven Lee

Nuclear Security Governance for the 21st Century: An Action Plan for Progress by Kenneth Luongo

Nuclear Safeguards Concepts, Requirements, and Principles Applicable to Nuclear Security by Kenji Murakami

Learning from Nuclear Safety by Sharon Squassoni

Basis of a New Global Order for Nuclear Security by Irma Arguello

**Workshop Summary Report: *Improving Nuclear Security Regime Cohesion***

### Promoting Greater Transparency in Nuclear Security

*London, United Kingdom – September 2012 | Agenda*

Regional Approaches to Nuclear Security and Transparency: The Example of Argentina and Brazil by Rodrigo Alvarez

Incentives in the New Global Order for Nuclear Security by Irma Arguello

Strengthening the Global Nuclear Security System and the Role of International Assurances by Deepti Choubey

Value and Challenges of Regularized Consultations and Information Sharing Between Facility Security Managers by Roger Howsley

New Opportunities for Nuclear Security Best Practice Sharing: The Role of the Centers of Excellence by Yoo Hosik

Migrating Nuclear Safety Information Sharing and Review Mechanisms into the Security Regime by Anita Nilsson

**Workshop Summary Report: *Promoting Greater Transparency for Effective Nuclear Security***

### Building International Confidence and Responsibility in Nuclear Security

*Amman, Jordan – November 2012 | Agenda*

Global Governance as a Way of Balancing Sovereignty with Global Responsibility by Dong Hwi Lee Professor

Addressing the Transnational Nature of Nuclear Incidents by Togzhan Kassenova

An Assessment of the Nuclear Security Centers of Excellence by Alan Heyes

Media and Public Engagement Around the Nuclear Security Summits by Jennifer Smyser

Defining the End State of Nuclear Security by Kenneth Luongo

**Workshop Summary Report: *Building International Confidence and Responsibility in Nuclear Security***



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### **Acknowledgements**

The NSGEG would like to thank our colleagues Michelle Cann and Sarah Williams at the Partnership for Global Security for their substantive contributions to this report and our workshops. We are also extremely grateful for the support provided throughout this project from the staffs of the Asan Institute for Policy Studies and the Stanley Foundation, particularly Yunhwa Choi, Lisa Collins, Patty Papke, and Amy Bakke.

*This is a consensus document endorsed by the members of the NSGEG, but it does not necessarily represent the views or have the endorsement of their affiliated institutions.*

## NSGEG Partner Organizations

### **The Asan Institute for Policy Studies**

The Asan Institute for Policy Studies is an independent, non-partisan think tank with the mandate to undertake policy-relevant research to foster domestic, regional, and international environments conducive to peace and stability on the Korean peninsula, as well as Korean reunification. The Asan Nuclear Policy & Technology Center (ANPTC) aims at producing balanced policy options to achieve a nuclear weapons free Korean peninsula and to promote the peaceful use of nuclear energy. The Center, as the only independent forum of its kind in Korea, strives to build a solid network and to create synergistic effects between nuclear policy experts and technology experts. By improving dialogue between domestic and foreign nuclear experts, and facilitating the exchange of ideas between the government and private sectors, the Center seeks out comprehensive solutions to current nuclear issues such as the North Korean nuclear problem, role of new nuclear suppliers, nuclear safety and security, etc. The Center also aims to promote bilateral, regional and international nuclear cooperation such as ROK-US nuclear energy cooperation, Northeast Asian nuclear safety cooperation and global nuclear security cooperation. Papers, events, and other information are available at <http://asaninst.org/eng/>.

### **The Partnership for Global Security**

The Partnership for Global Security (PGS) analyzes the convergence of the security, technological, and economic issues that are shaping the 21st century's global nuclear challenges. Its focus is on creating the broad and integrated networks of private and public partnerships and the analyses that are necessary to strengthen international security and fight transnational threats. PGS has a global reputation and reach and a long track record of success. It operates by identifying and analyzing key emerging global security challenges. It often convenes diverse constituencies that have a stake in the issues and their effective solution, identifying common interests among these parties. PGS then develops initiatives and actionable policy recommendations and packages the best solutions for policy makers in an accessible form. Its analyses and events have resulted in the creation of new international security programs and substantially increased funding for important security initiatives. More information and publications are available at [www.partnershipforglobalsecurity.org](http://www.partnershipforglobalsecurity.org).

### **The Stanley Foundation**

The Stanley Foundation seeks a secure peace with freedom and justice, built on world citizenship and effective global governance. It brings fresh voices, original ideas, and lasting solutions to debates on global and regional problems. The foundation advocates principled multilateralism—an approach that emphasizes working respectfully across differences to create fair, just, and lasting solutions. The Stanley Foundation's work recognizes the essential roles of the policy community, media professionals, and the involved public in building sustainable peace. Its work aims to connect people from different backgrounds, often producing clarifying insights and innovative solutions. The foundation is a nonpartisan, private operating foundation, located in Muscatine, Iowa. Current areas of programming focus are global leadership, nuclear material security, and preventing genocide. Stanley Foundation reports, publications, programs, and a wealth of other information are available on the Web at [www.stanleyfoundation.org](http://www.stanleyfoundation.org).

## **Nuclear Security Governance Experts Group (NSGEG)**

The NSGEG is a globally diverse group of experts assessing the current state of nuclear security governance and developing a realistic and comprehensive set of policy recommendations intended to facilitate the evolution and improvement of the nuclear security regime.

**NSGEG** 

