

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

NSGEG Workshop on Improving Nuclear Security Regime Cohesion
Seoul, South Korea
July 18-19, 2012

Kenneth N. Luongo
Partnership for Global Security

Building the Foundation for Improved Governance

The Nuclear Security Summits (NSS) in Washington in 2010 and in Seoul in 2012, and the nuclear expert and industry corollary events organized around these summits, have opened a window of opportunity to develop new strategies and policies for the improvement of global nuclear security. The current nuclear material security regime has improved over the past ten years, but it is still not comprehensive or robust enough to address the evolving challenges of the 21st Century. It also lags behind other regimes for nuclear safeguards, safety, and arms control in terms of its binding requirements and assurances of compliance.

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 twenty-first century nuclear material security architecture will require additional and likely more controversial actions beyond the current international consensus. What is needed is an international nuclear security regime that is more comprehensive, cohesive, and transparent and which emphasizes confirmed performance and accountability by nations to build international confidence.

The basis for this policy evolution has been established. The theme of the Seoul experts meeting was “Innovating Nuclear Security Governance.” At the Seoul NSS, Australian Prime Minister Julia Gillard, recommended to the assembled nations that, “we need to establish an accountability framework for nuclear security that builds confidence beyond 2014.”¹ As part of this system, she suggested consideration of peer reviews of security to ensure high levels of protection and promote transparency.

More recently the Asia Pacific Leadership Network (APLN), a group that includes over 20 former Prime Ministers, foreign ministers, and prominent experts from the region, issued a “Statement on Nuclear Security”² that called for binding nuclear security standards; mechanisms for transparency, reporting, and accountability; universalization of nuclear security conventions; and a strengthening of the role of the International Atomic Energy Agency (IAEA). Further, former U.S. government officials, including former Secretary of State George Shultz, called for independent peer review of all aspects of the nuclear enterprise (including security) and called for a comprehensive, universal, and enforceable nuclear control regime.³ In addition, the Seoul summit defined the scope of nuclear security as being beyond protecting fissile materials to include the security of nuclear facilities and high-intensity radiological materials.⁴

Even a year ago, few outside experts were calling for these types of far reaching nuclear security initiatives, and they had virtually no currency inside governmental circles. But, the climate clearly has shifted and new ideas are being considered at the expert level and among some key

nations, including South Korea and Australia. This raises a significant new opportunity for the Netherlands, which will host the next NSS in 2014, and for those governments and experts that believe that more needs to be done to improve nuclear security on a global basis.

The Contributions of the NSS Process

The Washington and Seoul summits solidified and underscored the key elements of the current nuclear material security regime. However, they did not require countries to take any specific action beyond those that they wanted to take. The summit communiqué and work plan only outlined specific actions and policy objectives without making implementation mandatory.⁵ The most specific actions toward nuclear material security improvements were declared unilaterally by individual nations in attendance or jointly as part of “gift baskets”.

However, the NSS process has created some important new precedents in the nuclear security arena. These summits allow for a package of ideas and activities to be placed before more than 50 heads of state for approval – by all, at the same time. That is a unique circumstance that previously had not existed before 2010. But the summits have also established the precedent that while the pursuit of improved nuclear material security should be multilateral, it can also be selective in the nations that exercise leadership. This gives some international legitimacy to non-universal action in support of nuclear material security. Another important precedent is that it seeks to achieve goals within set timeframes, like implementing the national commitments made at the Washington summit before the Seoul event.

The Seoul summit also was an important evolution over the Washington NSS, primarily because it expanded the scope of what should be included in the definition of nuclear security to explicitly include radiological source security and the interface between nuclear safety and security. This evolution in large part is attributable to the interest of some key government and as a result of the nuclear reactor accident at Fukushima in Japan. For many, Fukushima underscored that nuclear disasters can occur in an extremely technologically advanced country, as a result of an unanticipated event, and have significant economic and social consequences. The impacts of a nuclear reactor accident also can be indistinguishable from an act of nuclear terrorism in terms of unauthorized radiation releases. In addition, the accident at Fukushima made it clear that the global community does not have an adequate system in place to deal with nuclear crises that extend beyond borders.

In fact, in the aftermath of the Fukushima accident a number of high-level international discussions were held, including at the IAEA and the United Nations (UN). As a result of a conference on nuclear safety and security held in September 2011, UN Secretary General Ban Ki Moon declared that, “The effects of nuclear accidents respect no borders. To adequately safeguard our people, we must have strong international consensus and action.”

The decision to hold another nuclear security summit in the Netherlands in 2014 provides an opportunity to build on these statements and the others issued since March to both reframe the nuclear material security debate and initiate some key changes in strategy and policy. If this can be done, then the next challenge will be to devise a strategy for keeping this agenda moving forward at a high level after the Netherlands NSS, when the summit process may end and be absorbed by an existing or new mechanism.

The Current Nuclear Security Regime

The current nuclear security regime has improved over the past ten years, but it still lags behind other nuclear regimes, including safeguards, safety, and arms control. At the very least all of these other regimes require some element of transparency and/or verification of commitments. The current nuclear security regime is still very sovereign—designed and controlled by national agencies and actors. International obligations are largely voluntary with no uniformity of security regulations or procedures. In addition, the nuclear security regime has been primarily focused on fissile materials not high intensity radiological sources or the interface between nuclear security and nuclear safety. These all are major gaps in the regime.

What is needed is a comprehensive, confidence building architecture that emphasizes demonstrated performance and accountability. It must be comprehensive and include clear but flexible standards.⁶

The current nuclear material security regime is composed of three major elements: domestic laws and regulations that govern security on a nation's territory; international agreements and institutions and UN Resolutions that supplement domestic security laws; and ad hoc, cooperative measures in which nations voluntarily agree to participate.

- ***Domestic Activities.*** The first line of defense for the security of nuclear materials resides with the country that manufactured or stores them. 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 control, and it is a major reason why the Washington summit did not seek to break new ground by introducing new initiatives.
- ***International Conventions, Agreements, and Institutions.*** There are a handful of major international agreements and conventions that govern nuclear material security, though there are also others that have applicability to terrorist activities using weapons of mass destruction more directly.⁷
 - Convention on the Physical Protection of Nuclear Materials (CPPNM) and its Amendment
 - International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT)
 - United Nations Security Council Resolutions (UNSCR): 1373, 1540, and 1887
 - IAEA documents and services, including Information Circular 225/Revision 5, Nuclear Security Plan for 2010-2013, Nuclear Security Guidelines, Nuclear Security Fund, and advisory services
- ***Ad Hoc, Cooperative, and Nongovernmental Activities.*** With the collapse of the Soviet Union and concerns about “loose nukes,” the nuclear nonproliferation regime in the 1990s expanded from consisting primarily of arms control treaties to also include new, non-treaty based (ad-hoc) initiatives. The first of these initiatives was developed between the U.S. and Russia, but other multilateral initiatives followed.
 - Cooperative Threat Reduction (CTR) and related U.S. programs
 - G-8 Global Partnership
 - Global Initiative to Combat Nuclear Terrorism (GICNT)

- Proliferation Security Initiative
- World Institute for Nuclear Security (WINS)

Challenges to Current Regime Effectiveness

The list of the current elements of the nuclear security regime is long, and in many ways impressive. The problem is that it is not comprehensive, cohesive, and current given the evolution of nuclear threats and challenges in the 21st Century. That threat has gone through many evolutions from the superpower arms race, to rogue regimes, to loose nukes, to nuclear terrorism. Today, the threat is all of those issues as well as the expansion of fissile material stockpiles and nuclear reactors in volatile regions.

The Threat

The 2010 U.S. Nuclear Posture Review and National Security Strategy identified nuclear terrorism as the greatest and most urgent threat facing the United States.⁸ Some consider the threat to be an obsession of developed nations and a problem primarily for the nuclear weapons states, but this is an incorrect reading of the danger. It is important to recognize that even small amounts of material in any country, if not adequately protected, are a danger. There is a very large stockpile of fissile material around the globe – rough estimates put it at 1440 metric tons of highly-enriched uranium (HEU) and 495 metric tons of plutonium.⁹ About half the world's fissile material is in military stockpiles and the rest is in civilian stockpiles, including those in non-nuclear weapon states. Nuclear smuggling provides one window into the reality of the threat. According to the IAEA, there have been 1600 cases of illicit nuclear trafficking since 1993 and 18 cases of the theft or loss of HEU or plutonium.¹⁰

Radiological terrorism is a related threat and is considered to be a higher probability event than a nuclear attack.¹¹ There have also been at least three cases of holding radiological sources for ransom.¹² But, the issue of high-intensity radiological source security has been inadequately prioritized in the nuclear material security regime. This is beginning to change. The U.S. National Nuclear Security Administration (NNSA) has been working with hospitals and other users of high-intensity radiological materials to improve the security of these sources above the requirements imposed by the nuclear regulators. Focusing first on major metropolitan hospitals, the upgrades are voluntary and not all facilities have agreed to cooperate, but in some key cities significant improvements have been made. U.S. Senate has expressed an interest in expanding this concept of radiological security outside U.S. borders and has asked NNSA to report back to them on planning for regional Radiological Zones of Security (RZS) around the globe.

The third key element of the threat is that posed to nuclear reactors and related facilities. Post-9/11 and then again post-Fukushima, government and international organization officials, facility operators, and regulators evaluated the adequacy of security at nuclear facilities and made evaluations and in some cases regulatory changes. But, the growth of nuclear power in the 21st century offers new challenges beyond the existing rules and regulations.

Nuclear Expansion

Compounding the danger posed by the growing stockpiles of fissile and radiological materials is the anticipated growth of nuclear facilities and power particularly in historically unstable regions. Nuclear power's growth is a global fact and the regime for protecting these materials and facilities needs to evolve with this reality. Governments and international organizations will

need to think more creatively about the evolution of the governance structures for nuclear safety and security, and the nuclear energy industry will need to accept more responsibility for the protection of its products¹³. The accident at Fukushima, in addition to highlighting the global impact of an accident at a nuclear power plant, has distorted the once clear line between nuclear safety and nuclear security. Although the accident was caused by nature, the way in which the reactors were affected and the radiation release were largely indistinguishable from an act of terrorism. Looking beyond physical attacks on nuclear reactors, the challenge of cyber terrorism and its potential impact on nuclear reactor operation is a looming threat – one that many complex industrial operations face.

Fissile Material Production

While the protection of nuclear infrastructure is an important objective, the most obvious path to the creation of a terrorist improvised nuclear device is through the acquisition of fissile material. Most of the NSS process has focused on preventing this scenario by encouraging improved protection of these materials, the consolidation and down-blending of excess materials, and the conversion of civil reactors that use HEU to non-weapons grade fuel. Also, while virtually all the declared weapons states have ended their production of fissile materials for weapons, HEU and plutonium production for both civil and military purposes continues in some key countries and some volatile regions, particularly South Asia. This raises questions about the adequacy of the current regime and whether it is sufficiently adaptable to these evolving circumstances as well as adequately effective in the face of new challenges.

Inadequate Cohesion and Transparency

The nuclear material security regime lacks cohesion and focus because many of its elements were developed in response to national objectives, crises, or opportunity, not as part of a rational regime development process. A statement by Indonesia at the Seoul NSS summed up the challenge of establishing greater coherence in the nuclear security regime, “there are many international legal instruments and frameworks in nuclear security that exist under the aegis of the UN, IAEA and other international organizations. Some of them are internationally legally binding in nature, while the rest are voluntary or non-legally binding. Meanwhile, at the national level, the implementation of instruments and frameworks on nuclear security involve a wide range of national stakeholders.”¹⁴

The elements of today’s regime should be carefully analyzed and rationalized so that overlaps, duplications, and inefficiencies can be eliminated. Then the gaps can be identified and filled. The most significant challenge to improving nuclear material security worldwide is that the security of nuclear materials is not uniform across borders. Moreover, security systems are not transparent, creating real and perceived vulnerabilities about the security of nuclear materials in each nation.¹⁵

In general, the security of military-related fissile materials will always remain highly sensitive and little transparency should be expected soon. But, gradual transparency and trust building is possible with political will. The U.S., Russia, and former Soviet states have proven for over 15 years that fissile material security can be a subject of discussion among former adversaries if there is sufficient will and adequate protections for confidentiality.

Key Themes for Governance Evolution

When assessing the challenges of the current nuclear security regime and looking forward to what should be created over the coming years, three key interrelated themes can be identified – promoting greater transparency, improving regime cohesion, and building international confidence and global responsibility. This structure would allow for the development of recommendations that can both outline the leaps in international nuclear security policy that are required and also allow for the identification of specific, concrete steps that will allow for the achievement of the larger goals. This approach will provide a barrier against concerns that this agenda is too difficult to accomplish as well as allowing for the definition of the end state that all nations should be working towards to truly protect against nuclear terrorism.

Promoting Greater Transparency

The value of transparency has been acknowledged as an important element in addressing complex transnational challenges in the 21st century. The importance of transparency has been an important element in addressing the global economic crisis, mitigating climate change, and targeting sanctions to limit financial transactions, among other issues. The goal of transparency is to increase international confidence and ensure that standards are being implemented. These also are key issues in the nuclear security area. Some of the questions that need to be addressed in this area include:

- How to encourage making more information available on states' implementation of the current regime's requirements and elements?
- What is the intersection of, and overlap between, nuclear material security, nuclear safety, and nuclear safeguards?
- What are the crossover benefits from the safety and safeguards regimes for the security regime (including but not limited to standards/guidelines, regular assessments, reporting, and peer review)?
- How can confidential and sensitive information be protected in an environment of greater information reporting/sharing and peer review?
- What are management's and regulator's roles in facility level transparency, compliance, and reporting?
- Is there a value in establishing a review conference/mechanism for the Convention on the Physical Protection of Nuclear Materials and other international instruments?
- Should there be regularized consultations among national nuclear regulators and facility security managers?
- Is there value in convening an annual meeting on the state of global nuclear security that involves all relevant stakeholders (governments, international organizations, regulators, nuclear energy industry, NGOs and experts) and addresses the range of global initiatives that are applicable to nuclear security governance?

Improving Regime Cohesion

The patchwork nature of the current nuclear material security regime is very clear. Identifying how that can be improved and unified is one important challenge. But another is then defining the intersection between nuclear security and nuclear safety as facilities also fall under the security umbrella, and integrating radiological security measures into the new regime. Some of the questions and issues that need to be addressed in this area include:

- Clearly identifying the strong points and benefits of the current regime and the gaps that need to be addressed.
- Identifying the enhanced security value of universalizing the current regime elements.
- How can existing nuclear governance practices, preconceptions, and institutions most effectively and efficiently evolve to keep pace with the threat?
- Is there value in creating a “standard” or “baseline” that countries should recognize and implement in protecting their nuclear materials and facilities?
- What is the most effective use/deployment of INFCIRC 225 Rev. 5 and other IAEA recommendations in this baseline approach?
- Can nuclear cooperation agreements be a vehicle for instituting peer reviews and uniform security standards?
- Is Euratom a precedent that can be utilized?
- What are the benefits for the nuclear security regime of developing a framework convention on nuclear security, and what is the most effective path toward this goal?
- What are the components of the framework convention and its subsequent protocols?

Building International Confidence and Global Responsibility

The goal of expanding and improving the nuclear security regime is to increase international confidence that security practices in all countries are as robust as possible, with adequate peer review and transparency. However, because of the sovereign nature of many nuclear activities, there also will need to be a balance between increasing global responsibility for nuclear operations and sovereign control. Some of the questions and issues that need to be addressed in this area include:

- Defining the end state of “no weak links/states” in nuclear security implementation.
- Balancing sovereignty with international responsibility so that both are served.
- How to address the transnational nature of nuclear incidents, accidental and intentional?
- What is the most beneficial role of the network of centers of excellence in improving nuclear security governance?
- How can the global public be more engaged and educated on the danger of nuclear terrorism and the importance of strengthening the international nuclear management and security system?
- How can the benefits of the Nuclear Security Summits be preserved, and the agenda advanced, if the summits themselves are ended?

Action Plan for Evolving Nuclear Security Governance

Moving the nuclear materials security regime beyond its current envelope will not be an easy task, and is likely to engender opposition and obstruction from a number of countries and experts. But, the current system is too fragmented, too ineffective, and not well suited to future challenges. There are two institutional avenues that should be utilized to evolve, expand, and strengthen the nuclear security regime. One is to utilize the new centers of excellence that are being established around the globe as a result of the NSS process. The other is to develop a framework agreement for nuclear security that can codify the new regime and give it durability beyond the summit and post-summit processes.

Centers of Excellence

One potential step forward that the NSS process has helped generate is growth in the supporting infrastructure for nuclear security through the creation of new centers of excellence.¹⁶ At the Washington NSS China, India, Japan, Kazakhstan, and South Korea pledged to create these centers. In Seoul, new centers were pledged by Algeria, Brazil, Chile, Lithuania, the Netherlands, Nigeria, Pakistan, Saudi Arabia, and South Africa.¹⁷ The original center of excellence was the Russian Methodological and Training Center located in Obninsk, Russia which was formed as a joint project with the U.S.

The European Union (EU) has also launched a Chemical, Biological, Radiological and Nuclear (CBRN) Center of Excellence Initiative to help countries' and regions' maintain the institutional capacity needed to fight these threats.¹⁸ It aims to establish centers of excellence in five regions of concern: South Caucasus/Ukraine/South East Europe, North Africa, West Africa, the Middle East, and South East Asia.¹⁹ This infrastructure development will make use of the capabilities of the IAEA, which is attempting to coordinate among them, and that of WINS as well as individual nations.

Japan opened its center of excellence in December 2010, India launched its center with a regional training course in November 2011, and the EU established a Secretariat for the Middle East center in Amman, Jordan in December 2011. China has signed an MOU to cooperate with the U.S. and is constructing a new facility. The South Korean center is scheduled to open in 2013.

The role of these centers is envisioned to be as repositories and disseminators of nuclear material security best practices. But they also can become advocates for improvements in the governance structure and work on some of the key questions that need to be addressed. These include how to: facilitate transparency to generate international confidence without revealing sensitive information; better secure high intensity radiological sources; and improve the independence and coordination of regulatory authorities.

A Framework Agreement

While the NSS has taken the important step of establishing global fissile material security as a top-level international objective, the achievement of improved nuclear security governance will require actions beyond the current mechanisms and international consensus. A key question remains what will happen to the momentum for improvement of the global regime if the summits were to end after the meeting in 2014. There needs to be a more permanent, cohesive, and comprehensive international instrument for the regime.

A Nuclear Material Security Framework Agreement is one approach that could address this challenge. A framework agreement would allow the subject to be acknowledged at a very high political level as a global priority and then require the adherents to take specific steps to achieve its objectives either in the text or through subsequent protocols.²⁰

The framework 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. It must be clear that security systems have to evolve to meet the changing threats.
- Recognize all the relevant existing conventions, agreements, and Security Council resolutions and state that universal acceptance of these agreements and their rigorous implementation are fundamental for effective and sustainable nuclear security.²¹
- Recognize the importance of the IAEA in all areas of nuclear security and request greater international political and financial support for its activities.
- Clearly establish the legitimacy of ad hoc mechanisms such as the CTR program, the G-8 Global Partnership, and the GICNT 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 UNSCR 1540.
- Recognize that the production and use of HEU for civil purposes should be limited and eventually eliminated, 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 through an intensive process of global best-practices and security culture engagement utilizing contributions from individual nations, the IAEA, WINS, and the centers of excellence.
- Underscore the need for a better balance between voluntary and mandatory security commitments, standards, and practices.
- Identify the need for a baseline standard for nuclear and radiological 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 actions. The protocols could specify actions to be taken by individual nations, identify 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.²² It also should include an amendment process and a regularized review conference.
- Include an annex with individual national commitments that will be undertaken to improve nuclear material security, similar to the “house gifts” and “gift baskets” provided at the Washington and Seoul NSS’, but with the ability to continually supplement the list, rather than waiting for a summit.

This agreement should eventually be universal, but its development could begin with support from a coalition of committed nations. However, its legitimacy would be strengthened if it had political support in the developing as well as in the developed world.

Framework Agreement Precedents

Framework agreements addressing transnational challenges, like nuclear material security, have precedent, 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.²³ Models for the framework agreement on nuclear material security include the Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol, the U.N. Framework Convention on Climate Change (UNFCCC), and the Convention on Nuclear Safety (CNS).

*Vienna Convention and Montreal Protocol*²⁴

- The Vienna Convention focused on phasing out chlorofluorocarbon gases damaging to the ozone layer and established the precedent of agreeing to general principles in an accord before negotiating additional implementation protocols with specific, binding actions. The Montreal Protocol contains legally binding restrictions on ozone impacting chemicals and includes special provisions to enable the long-term adaptability of its targets and limits.
- Participation in these agreements grew from a small group of ratifying countries to near universality. Ozone agreements were the first to address a long-term transnational problem in which the damage caused in the short-term might not be evident for decades.

UN Framework Convention on Climate Change

- The UNFCCC followed the model of the Vienna Convention and Montreal Protocol to address climate change. It began with the framework convention and was followed by actionable protocols, such as the Kyoto Protocol.
- The UNFCCC also establishes a high-level international scientific advisory panel with a mandate to provide advice on relevant scientific and technical issues. While this panel is comprised only of governmental representatives, the model could be adapted to include private sector and nongovernmental experts in a nuclear security version.

*Nuclear Safety Convention*²⁵

- There are four major elements embodied in the CNS that have been critical to the improvement of nuclear safety over time that are not a part of the nuclear security regime: regularized assessments, information sharing, peer review, and reviews of the implementation of relevant international conventions.
- The nuclear safety regime is familiar to many in the nuclear business and considered to be more developed and robust than the nuclear materials security regime. It could offer a useful platform from which to begin the evolution of nuclear security governance.

Action Plan (2012-2020)

The Seoul NSS offered a very useful pivot point for a future focus on the evolution and improvement of the nuclear security regime for several reasons. First, there was a broad understanding, as a result of Fukushima, about the transnational implications of an unauthorized release of radiation and the inability of the international system to adequately address these implications. Second, the Seoul summit built on the foundation created by the Washington NSS and the participating states offered new commitments. Third, it created momentum for governance policy evolution leading up to the summit in the Netherlands by including radiological security and the interface between nuclear safety and security.

The approach to building a modernized governance regime should be careful and deliberate so as not to raise suspicions about hidden agendas or ulterior motives. It should also include a

nongovernmental track that can supplement governmental action, or more likely precede it by identifying paths forward and strategies that governments can then consider.

A two track approach to evolving nuclear security governance should be pursued – one official and the other non-governmental.

The expert process should be led by an independent group of professional and knowledgeable individuals from a cross-section of countries and disciplines. They should be committed to the evolution of nuclear governance, have the professional experience that allows their opinion to carry weight in the global community, and be creative in their thinking.

The governmental process does not need to be universal in the beginning but can utilize the Vienna Convention and even the NSS precedent of selective multilateralism.

The process should be broken down into two phases that culminate in 2020. The first phase should be interim goals for 2012 through 2016. And the second phase should be from 2017 through 2020.

Phase I

In the first phase the official process should:

- Continue the NSS process with meetings every two or three years.
- Seek near universal ascension and implementation of the key international conventions (CPPNM and amendment and ISCONT).
- Seek agreement by a selective and committed group of nations that improvement in nuclear security governance is necessary. This should result in a new nuclear security governance “gift basket” in the Netherlands that could include: (1) the creation of a working group to develop and review new governance ideas and proposals; (2) the initiation of a review of the overlap among existing nuclear material security regime elements and recommendations for the best path forward for streamlining them; (3) a demonstration of transparency measures on a bilateral or multilateral basis, perhaps utilizing remote monitoring and peer reviews; and (4) initiating limited steps toward the implementation of key elements of the safety regime in the nuclear security area. For example this might entail encouraging interaction among regulators from different nations, facilitating discussion among nuclear operators on security issues while protecting sensitive information, and increasing cooperation and information sharing between key stakeholder groups, for example through some regularized meeting process.
- Take steps to ensure that the new centers of excellence are effective and complimentary, with minimal duplication.
- Assist with the strengthening of WINS and related industry-focused organizations.

During this phase the expert process should:

- Create an independent Nuclear Security Governance Experts Group (NSGEG) that can assess the current state of nuclear security governance and make recommendations for changes and improvements. The group should be geographically diverse and cross disciplinary as well as selected for individuals’ commitment to creative solutions to the current challenges. The development of these recommendations is completely consistent with statements that have been made by the UN Secretary General, the IAEA, and the NSS.

- Continue outreach to governments, international organizations, and industry to find consensus on the mix of binding and voluntary measures for nuclear security that builds upon the current system.
- Develop the draft text of a new Framework Agreement for Nuclear Security possibly based on either or both, a UNSCR 1887-like resolution that could include a check list of the actions a nation must take in order to be considered a good global nuclear material security citizen and/or global goals similar to those outlined in the Vienna Convention and UNFCCC.
- Submit the draft framework agreement to the NSS nations for review and response.
- Begin to work on implementation protocols to the framework convention.

Phase II

In the longer term through 2020, the objectives should be to establish a new performance-based nuclear governance architecture that:

- Confirms the importance of national responsibility and recognizes the need for protection of people and the environment outside of national borders in the event of a crisis, accident, or terrorist event.
- Calls for regularized information sharing and international peer reviews of security practices and performance.
- Better integrates operators, regulators, governments, international organizations, and civil society as well as identifies their responsibilities.
- Mandates international nuclear security standards that reflect minimum performance criteria that are comprehensive, effective, succinct, and clear.
- Establishes effective response and communication methods in the event of a crisis, accident, or terrorist event.
- Establishes long-term technical, bureaucratic, and financial support for the new system.
- Results in the approval of the new Framework Agreement for Nuclear Security.
- Provides the IAEA with the responsibility for helping all nations meet the new governance obligations.

Conclusion

The NSS process has created a unique channel for improving global nuclear security. While the consensus-based approach of the official process has been important, it is not well suited to the development of dynamic new policies. The “house gifts” and gift baskets” concept offers much more flexibility for innovating the nuclear security regime and allows countries to exercise leadership. The momentum created by the first two summits, combined with the decision to extend the summit process to the Netherlands, creates the opportunity to build on prior achievements but also pivot to focus on more forward-looking policy options that respond to new and changing threats and requirements. Pursuing a two-track, two-phase approach to governance innovation could expand and solidify the fragmentary and incomplete nuclear security regime, deliver concrete achievements for the 2014 Netherlands summit, and result in cohesive and durable framework agreement by 2020. This will result in nuclear security governance that meets the realities of the 21st century.

¹ Julia Gillard, “Intervention to the Plenary of the Nuclear Security Summit, Seoul,” Prime Minister of Australia Press Office, March 27, 2012.

² “Statement on Nuclear Security,” Asia Pacific Leadership Network for Nuclear Non-proliferation and Disarmament, June 13, 2012.

³ Sidney Drell, George P. Shultz, and Steven P. Andreasen, “A Safe Nuclear Enterprise,” *Science*, June 2012: 1236; Richard Burt and Jan Lodal, “The Next Step for Arms Control: A Nuclear Control Regime,” *Survival: Global Politics and Strategy*, vol 53 issue 6, 2011, pg 51-72.

⁴ “Seoul Communiqué,” 2012 Seoul Nuclear Security Summit, March 27, 2012.

⁵ Jesse Lee, “An Enormously Productive Day,” White House Blog, April 13, 2010; “Seoul Communiqué,” 2012 Seoul Nuclear Security Summit, March 27, 2012..

⁶ This definition has been developed from various sources including the author’s work and that of Anita Nilsson, former Director of the Office of Nuclear Security at the IAEA, and Kenneth Brill, former U.S. Ambassador to the IAEA.

⁷ “Nuclear Security Work Plan Reference Document,” White House, April 13, 2010.

⁸ U.S. Nuclear Posture Review, April 2010; U.S. National Security Strategy, May 2010.

⁹ International Panel on Fissile Materials, “Global Fissile Material Report 2011,” pp. 2-3.

¹⁰ Tim Andrews, “Strengthening Global Nuclear Security: The Role of the IAEA,” Presentation to the Nuclear Security Conference, King’s College London, February 18, 2010; Conversations with IAEA officials, 2010.

¹¹ “Radiological Terrorism Tutorial,” Nuclear Threat Initiative, 2004.

¹² Conversations with IAEA officials, 2010.

¹³ Some steps in this direction have been taken by the nuclear industry.

<http://carnegieendowment.org/publications/special/misc/nppe/principles-of-conduct.pdf>

¹⁴ “National Legislation Implementation Kit on Nuclear Security,” Indonesian Non-Paper accompanying Joint Statement, 2012 Seoul Nuclear Security summit.

¹⁵ The Nuclear Threat Initiative has developed a methodology for beginning to judge the level of states’ nuclear security.

¹⁶ The concept for the infrastructure support is based on a presentation by Anita Nilsson, “Nuclear Security Summit – Considerations for 2012” at a discussion hosted by the Korean embassy and the Fissile Materials Working Group in Washington, D.C. January 12, 2012.

¹⁷ “Highlights of Achievements and Commitments by Participating States as stated in National Progress Reports and National Statements,” The Seoul Nuclear Security Summit Preparatory Secretariat, 2012.

¹⁸ “Key-Points of the CBRN CoE Initiative,” European Commission.

¹⁹ Didier Haas, “EURATOM Safeguards and Security Research in the Nuclear Fuel Cycle,” Amman, Jordan, November 30, 2011.

²⁰ The proposal for protocols based on the model of the Vienna Convention and the Montreal Protocol was suggested by Amb. Kenneth Brill at a workshop convened by the Korean Institute of Foreign Affairs and National Security, the U.S.-Korea Institute at John Hopkins SAIS, and the Partnership for Global Security, “Innovating Global Nuclear Security Governance: An Agenda for the Future”, Washington, D.C., December 19, 2011.

²¹ The priority of universality was proposed in a presentation by Anita Nilsson, “Nuclear Security Summit – Considerations for 2012” at a discussion hosted by the Korean embassy and the Fissile Materials Working Group (FMWG) in Washington, D.C. January 12, 2012.

²² The proposal for utilizing these protocols to provide new authority to the IAEA was suggested by Amb. Kenneth Brill at workshop convened by the Korean Institute of Foreign Affairs and National Security, the U.S.-Korea Institute at John Hopkins SAIS, and the Partnership for Global Security, “innovating Global Nuclear Security Governance: An Agenda for the Future”, Washington, D.C., December 19, 2011.

²³ An analysis of this issue was presented by Chang-Hoon Shin of the Asan Institute at a workshop convened by the Korean Institute of Foreign Affairs and National Security, the U.S.-Korea Institute at John Hopkins SAIS, and the Partnership for Global Security, “Innovating Global Nuclear Security Governance: An Agenda for the Future”, Washington, D.C., December 19, 2011.

²⁴ Edith Brown Weiss, “Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol on Substances that Deplete the Ozone Layer.”

²⁵ This section is derived from Luongo, Squassoni, and Wit, “Integrating Nuclear Safety and Security,” CSIS, November 2011.