

## POLICY PERSPECTIVES

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**Integrating Nuclear Safety and Security: Policy Recommendations***Kenneth Luongo, Sharon Squassoni and Joel Wit*

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In April 2010 at the first Nuclear Security Summit (NSS) in Washington, D.C., 47 nations agreed to take steps to prevent nuclear terrorism by assuring the highest level of protection for weapon-usable nuclear materials – highly-enriched uranium (HEU) and plutonium. They all agreed to a communiqué and work plan, and individual nations committed themselves to take specific actions within their borders to enhance nuclear material security.



*Official White House Photo by Pete Souza*

When leaders meet for the next nuclear security summit in Seoul in March 2012, they will continue this core focus on nuclear material security, but they will likely also address the implications and lessons of the March 2011 Fukushima Daiichi nuclear power plant accident. The severe damage to the reactor cores at Fukushima and local radiation

exposure has highlighted the importance of protecting the global population from all unintended releases of radiation – including from accidents and intentional acts.

This broader concern about protecting populations from radiation releases has led to several high-level international conferences on the effectiveness of current global nuclear governance. For example, countries in the European Union (EU) and elsewhere agreed to perform “stress tests” on their nuclear reactors to ensure that they were operating safely (but most EU states did not include nuclear terrorist scenarios as part of the stress tests).

In June, the International Atomic Energy Agency (IAEA) convened a ministerial conference on nuclear safety, producing a declaration and action plan on nuclear safety. The action plan, which details measures on “nuclear safety, emergency preparedness and response and radiation protection of people and the environment,” was approved by the IAEA Board of Governors and UN in September. The UN Secretary General expanded the dialogue in September with a high-level meeting on nuclear safety and security, stating that “the effects of nuclear accidents respect no borders. To adequately safeguard our people, we must have strong international consensus and action.”

Nuclear safety and security have developed along different trajectories in the last decades. The regime that supports nuclear safety – a combination of national laws and regulations, voluntary international agreements and conventions – matured quickly following the accidents at Three Mile Island and Chernobyl. The nuclear security regime, on the other hand, has advanced largely in response to the terrorist attacks on September 11, 2001 in the United States.



*Chernobyl Reactor Photo by Carl Montgomery*

The IAEA has increasingly recognized that there is an inter-relationship between these issues and has created a Department of Nuclear Safety and Security, although the issues are not well integrated among the member states. A 2010 report by the IAEA International Nuclear Safety Group (*Interface Between Safety and Security at Nuclear Power Plants*) concluded that, “Nuclear power plants benefit from a sophisticated and comprehensive safety regime that has been established over the years...the security regime for nuclear power plants is far less developed than the safety regime.”

As part of the international effort to further understand the intersection of nuclear safety and security in the post-Fukushima environment, the Center for Strategic and Intentional Studies (CSIS), US-Korea Institute at the John Hopkins School of Advanced International Studies (SAIS), and Partnership for Global Security (PGS) convened a workshop experts in late 2011 to discuss how crises have shaped nuclear safety policies, how operators balance and integrate safety and security practices at operating reactors, how the safety and security regimes can and should complement each other, and how the Seoul NSS may want to address the two issues at the next summit. Approximately 30 participants from the U.S. and Korean governments, the nongovernmental community, and private sector attended.

The following captures key elements of the discussion at the workshop and may be of interest to policymakers ahead of the 2012 NSS.

## How Can We Learn from Nuclear Safety?

Five elements central to the nuclear safety regime have direct applicability to the nuclear security regime but are not yet integrated into it. These include:

- regularized assessments
- information sharing
- peer review
- reviews of the implementation of relevant international conventions and
- strong trade organizations.

Four of these elements are embodied in the Convention on Nuclear Safety (CNS) and have been critical to the improvement of nuclear safety over time. Neither of the nuclear security regime’s key international conventions – the Convention on the Physical Protection of Nuclear Materials (CPPNM) and its amendment nor the International Convention for the Suppression of Actions of Nuclear Terrorism (ICSANT) includes provisions for assessment, information sharing or peer review. A single CPPNM review conference was held in October 1992, five years after it entered into force as required by Article 16, during which unanimous support for the CPPNM was expressed by the 35 states in attendance. CPPNM parties came together again in the late 1990s and early 2000s to strengthen and expand the scope of the convention by amending it to better address threats of nuclear terrorism, smuggling, and sabotage. An amendment was adopted in 2005, but will not come into effect until two-thirds of the state parties ratify the changes. The ICSANT has a provision for an amendment conference but not a review conference.

In addition, strong industry-financed organizations like the Institute of Nuclear Power Operators (INPO) and World Association of Nuclear Operators (WANO) have been created to facilitate international peer review of nuclear reactor safety. The World Institute for Nuclear Security (WINS) was launched in 2008 to provide a forum for sharing and promoting nuclear security best practices and it has focused attention on integrating security into nuclear facility operations on a par with nuclear safety. But, it is not as institutionally robust yet as INPO and WANO.

*At the 2012 NSS: A commitment could be made to take action on assessing how regularized security assessments, information sharing, peer review, and reviews of the implementation of the CPPNM could be applied to the nuclear security regime over time.*

### **What are the Barriers to Adopting Elements of the Nuclear Safety Regime?**

Although adopting (and adapting) certain elements of the nuclear safety regime could significantly strengthen the nuclear security regime, at least four challenges are likely to surface: national sovereignty, information transparency, lack of policy consensus, and challenges of regime harmonization.

International conventions, IAEA guidance, and the 2010 NSS documents emphasize the national responsibility for nuclear material security. In the nuclear safety area, accidents like Chernobyl and Fukushima have demonstrated however, that nuclear crises do not respect borders and that there is a need to think beyond national approaches and regulations for sufficient protection of the global community.

The focus on sovereignty with respect to nuclear security is especially highlighted in the area of information security. As noted by the INSAG, “the general rule in the nuclear safety area...is to pursue transparency...[while] in the security field, the sharing of information should typically be restricted to...prevent sensitive information...from falling into the hands of adversaries.” Not surprisingly, information exchanges and peer reviews have not played a large role in the nuclear security regime.

Nonetheless, some countries, most notably the United States and Russia, have found ways to work together on improving the security of the most sensitive nuclear materials and facilities without compromising security information. Increasing transparency does not mean making sensitive information public. Confidentiality among parties can be maintained, as is the case when countries collaborate with the IAEA on nuclear safety. But information sharing can also promote international confidence. For example, country reports submitted as part of the Convention on Nuclear Safety review process were

originally kept confidential, but for the last few years, most have been posted online because countries determined that their interests were better served by openness than secrecy. Also, general knowledge about U.S.-Russia cooperation has increased international confidence in the security of nuclear materials in Russia.

It will ultimately fall to national leaders to decide the policy evolution of the nuclear security regime. Although consensus on policy improvements may be preferable, that process could be difficult and result in inadequate policy solutions. As a complement to this process, countries could begin to evaluate and harmonize the existing elements of the nuclear security regime, especially in the nuclear material security area. The current regime is bulky and bureaucratically taxing. A streamlining process could be helpful in garnering policy consensus and adapting the security regime to address 21<sup>st</sup> century challenges.

*At the 2012 NSS: Identify national sovereignty, lack of information transparency, lack of policy consensus and difficulties in regime harmonization as issues to be addressed as the nuclear security regime and the NSS process evolve.*

### **Why Move Beyond Current Paradigm?**

The largely voluntary and national nature of the implementation of nuclear safety and security is in conflict with the fact that nuclear crises do not respect borders.

The nuclear safety and security regimes rely principally on national decision-making, laws, and regulations. This is supplemented by international agreements and organizations that largely offer voluntary guidance. In general, the implementation of the regimes is incentive-based and many believe that this is preferable to mandatory requirements.

Introducing more binding international standards however, could address concerns about weak links in national nuclear safety and security regulation and implementation. They could supplement the current regimes without dismantling the incentives in place. The objective would be to have greater uniformity of safety and security standards and to encourage countries and operators that are lagging to

improve up to the highest standards. One option for international standards could include negotiating a baseline for nuclear security, or states could provide advance



Members of the IAEA fact-finding team at Tokai Daini Nuclear Power Plant, Japan on 26 May 2011. Photo by Greg Webb / IAEA

consent to the IAEA for periodic evaluations of their nuclear safety and security measures, similar to safeguards inspections. Another is to increase the number of requests and funding for IAEA International Physical Protection Advisory Service (IPPAS) assessments or establishing bilateral or regional exchanges of information.

*At the 2012 NSS: The need for an optimal balance between mandatory international standards and voluntary actions should be addressed to supplement the national approaches to nuclear safety and security. Participants at the next NSS could endorse the exploration of additional binding and non-binding international safety and security requirements.*

### **Confidence in Nuclear Energy**

In order to maintain public and political confidence in nuclear power as it expands in the 21st century, there must be greater confidence in the overall protection of facilities and materials.

In the wake of the Fukushima crisis, public confidence in the ability to manage the risks associated with nuclear power dropped significantly, particularly in South Korea and Japan. But Asia is an area of projected major growth in nuclear power in the 21st century. So, additional steps

must be taken both to ensure that existing and new nuclear facilities are as safe and secure as possible.

Strengthening the independence of national nuclear regulatory authorities is one action that is needed. Operators primarily look to their national regulators for safety and security guidance and requirements. Regulators must be strong, independent, and technically competent to ensure that rules are instituted and enforced. This is not an issue just for developing countries; Japanese regulators have come under scrutiny for a lack of independence since Fukushima and now steps are being taken in both Japan and South Korea to increase regulatory independence.

Harmonizing accident/incident reporting parameters and expanding information sharing and transparency in a crisis is another important requirement. The first duty of operators is to manage the crisis, rather than provide information to the public. But, public concerns are important and are influenced heavily by the quality of information provided and the transparency of authorities. During the Fukushima accident, governments and media reported complex data which was difficult to translate properly to the lay public and often was inconsistent. Effective analysis and response to nuclear crisis can benefit from clear communications that utilize standardized evaluation metrics and reporting requirements. There is little international consensus on incident reporting beyond the IAEA's international nuclear and radiological event scale which conveys only the most basic details.

Incorporating security as a fundamental element in new reactor designs and in reactor operations is another important option to pursue. Safety has become a core value of the nuclear industry, and it is reflected in their efforts to retrofit old reactors with new safety features and incorporate passive safety features into new reactors. Fortunately, many of the new safety designs also contribute to improved security. But safety and security objectives can also be in conflict. It is important that security not be treated as a subset of safety, but rather promoted as a fundamental priority alongside it. Regulators have an important role to play in ensuring that both safety and security culture are robust.

*At the 2012 NSS: A statement in Seoul should support strengthened independence of nuclear regulatory authorities in all nations, harmonization of accident/incident reporting parameters and expansion of information sharing and transparency in a crisis, incorporation of security as a fundamental element in new reactor designs, and robust protection of nuclear facilities, including against cyber attack.*

### **Goal of Continual Improvement**

The priority of continually improving nuclear safety and security must remain high in all nations whether the NSS process continues beyond Seoul or not.

It is unclear what path the international dialogue on nuclear security will take after the 2012 NSS. If future summits are scheduled, the high-level attention, consultation process, and spillover activities in the nongovernmental and industry communities will likely continue to shine a spotlight on advancing global nuclear security. This could help further the integration of nuclear safety and security. However, if they do not continue, other means to drive the agenda must be found. Policymakers should begin to build on the foundation of the NSS process now so that continually improving nuclear safety and security remains high on the international agenda.

Encouraging civilian nuclear operators to engage with their foreign counterparts on nuclear security best practices is one positive step. Such dialogues would require that sensitive data be protected; however, the U.S. government's engagements with countries like Russia, Pakistan, and China on nuclear security demonstrate that space exists to share best practices without compromising security. Regulators from different countries also should be encouraged to meet and exchange views and information. The World Institute for Nuclear Security can play a useful role in these dialogues.

Another step would be to regularize dialogue and interaction among all stakeholders - nuclear operators, regulators, international organizations, and policy experts. Creating a forum to bring all relevant and responsible stakeholders together for periodic, candid discussion would provide a vital information input to advance nuclear

governance and safe and secure plant operations. This dialogue, for example, could be sponsored and facilitated by the past or future NSS host country.

*At the 2012 NSS: This objective of continual improvements can be bolstered by encouraging civilian nuclear operators and regulators to engage with their foreign counterparts on nuclear security best practices while protecting sensitive information and creating the opportunity for regularized dialogue and interaction among nuclear operators, regulators, international organizations, and policy experts.*

### **SUMMARY OF RECOMMENDATIONS**

At Seoul Nuclear Security Summit, states should:

1. Agree to assess how to incorporate elements of the nuclear safety regime (e.g. regularized assessments, information sharing, peer review, reviews of the implementation of relevant international conventions, and strong trade organizations) into the nuclear security regime over time.
2. Acknowledge that barriers such as national sovereignty, lack of information transparency, lack of policy consensus, and regime harmonization are significant challenges and need to be addressed.
3. Seek an optimal balance between mandatory international standards and voluntary actions and endorse consideration of additional binding and non-binding international safety and security requirements.
4. Support strengthened independence of nuclear regulatory authorities in all nations, harmonization of accident/incident reporting parameters and expansion of information sharing and transparency in a crisis, incorporation of security as a fundamental element in new reactor designs, and robust protection of nuclear facilities, including against cyber attack.
5. Encourage civilian nuclear operators and regulators to engage with their foreign counterparts

on nuclear security best practices while protecting sensitive information, particularly through the World Institute for Nuclear Security (WINS), and encourage regularized dialogue and interaction among nuclear operators, regulators, international organizations, and policy experts.

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