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Policy Perspectives

Integrating Nuclear Security Policy & Technology: Asian Centers of Excellence

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Introduction

Beginning in 2010, more than 50 world leaders have met three times as part of the Nuclear Security Summit (NSS) process. The NSS was proposed by U.S. President Obama in his 2009 speech in Prague, and it has resulted in the steady, incremental improvement of global nuclear security and the prevention of nuclear terrorism. The likely final summit will be held in Washington in 2016.

Two major themes of the summit process have been national commitments to security improvements and enhancement of international cooperation on nuclear security. One of the major achievements of the summits that serves both of these objectives is the creation of nuclear security Centers of Excellence (CoEs).

In 2010, Korea, China, and Japan made national commitments to open these centers to further nuclear security education and training. Japan's Integrated Support Center for Nuclear Nonproliferation and Nuclear Security (ISCN) opened in 2010 and began conducting courses in 2011. The Republic of Korea's International Nuclear Nonproliferation and Security Academy (INSA) opened in February 2014. The Chinese center is currently under construction and is slated to open in 2015.

East Asia represents a region likely to see a large growth in the use of nuclear energy over the next several decades, which makes it an important region for the continued development and application of high nuclear security standards.

At the 2012 NSS in Seoul, the communiqué welcomed the establishment of "Centers of Excellence" in nuclear security and encouraged networking activities among these institutions. That same year, 24 NSS participants signed a joint statement, also known as a gift basket, expressing their intention to collaborate on the development and coordination of a network of nuclear security CoEs. At the 2014 Hague summit, an updated CoE gift basket was presented by 31 countries to further the development of the CoE network. The CoEs, beyond Asia, include the IAEA's Nuclear Security Support Center (NSSC) network, the European Union's (EU) Chemical Biological Radiological and Nuclear (CBRN) Center network and a growing number of institutes, organizations, and stand-alone centers that focus on or include curricula on nuclear security.

The CoEs, in general, are developing with a particular focus on the technical aspects of nuclear security. This is both an important and necessary core of any center's work. However, this growing network could be even more effective in supporting a strengthened global nuclear security architecture if it integrates policy elements with its technical focus. Integrating policy development, education, evaluation, and related elements into CoEs supports the objective of the continuous improvement in global nuclear security and improves the ability for the CoE network to maximize its impact.

In the near-term, there are several important policy and technical-policy interface issues to which the CoEs could make contributions, including:

- Identifying non-sensitive information that can be shared beyond national borders to improve international confidence in nuclear security
- Evaluating policy options through simulation and table-top exercises
- Developing regional peer review
- Innovating best practices that can be standardized
- Testing approaches to observable confirmation of performance to build security confidence, including remote monitoring and video confirmation
- Developing criteria for personnel certification
- Networking with universities and diplomatic academies to develop a next generation of policy-technical specialists

Further, a networked, efficient, and dynamic CoE system can be one of the bridges for continued nuclear security innovation and national and multilateral commitments to improvement. After the Nuclear Security Summits end, there will need to be a structure that inherits the NSS process and continues the progress that has been made. This likely will be a multiple strand hand-off strategy, and the CoEs should be one significant element.

Integrating a Policy Component into the Centers of Excellence

The NSS process has evolved significantly since its inception in 2010, and it has added policy issues as it has progressed. One of the most important of these issues relates to the strengthening of the nuclear security regime.

The 2014 Strengthening Nuclear Security Implementation gift basket, or Trilateral Initiative, and paragraph 20 of the Hague communiqué identify specific actions that nations may take to improve nuclear security in their country and/or region and strengthen the overall regime. Many of these issues have significant policy components.

The gift basket specifically calls for signing states to "ensure that management and personnel with accountability for nuclear security are demonstrably competent." Also, states are called upon to consider information sharing while protecting confidentiality, training activities, certification, promoting R&D on nuclear security technologies, and regional cooperation. Paragraph 20 of The Hague communiqué calls for countries to share information about national laws and regulations and take advantage of the International Atomic Energy Agency's (IAEA) advisory and review services. The problem with both of these documents is that there is no mechanism to compel the signatory nations to actually implement their commitments in a timely fashion. This is an area where the CoEs can play an important role in facilitating national and regional implementation.

Information Exchange

At the Seoul NSS in 2012, countries agreed to share information to prevent illicit trafficking and improve forensics technology, and there was a specific call to improve information security. The 2014 Hague summit advanced this issue. Its nuclear security implementation gift basket and paragraph 20 of the communiqué both indicate support for sharing information that can improve international confidence in the global nuclear security system. This is a significant shift, as the emphasis in the nuclear security area has traditionally been focused on maximally protecting information, not sharing it.

The specifics of those two documents regarding what information should, or could, be shared are somewhat thin, focusing on relatively non-controversial laws and regulations. This would be a good start. However, there is a growing consensus in the expert community that the information that needs to be shared to improve international confidence extends beyond the legal and regulatory realm. Further, there is a growing indication that the emphasis should be on "what can be shared" rather than "everything needs to be protected." This evolution in emphasis represents a significant cultural sea change in the nuclear security area.

Clearly, the details on facility vulnerabilities, the specific threat spectrum to be defended against, and how precisely that is done is not information that can or should be openly shared. But other information is less sensitive. For example: How are countries fully implementing the IAEA's physical protection recommendations beyond their previous actions? If they are participating in a peer review process with the IAEA or others, how have they implemented the resulting recommendations? Have they completed a comprehensive threat analysis? Can they demonstrate the independence of their regulatory apparatus? Do they "red team" the security at their facilities to independently assess its adequacy?

Government agencies are unlikely to drive the process of answering these, and other relevant questions, or responding to The Hague's information sharing thrust. But, the CoEs can play a key role in determining whether the answers to these questions can safely be shared, with whom, and in what form.

They can begin by looking at existing examples both inside and outside nuclear security of how institutions share information, while protecting truly confidential knowledge, in a productive and effective manner. The Convention on Nuclear Safety requires parties to submit reports on their implementation of the Convention's provisions for periodic review. The Institute of Nuclear Power Operations (INPO) and the World Association of Nuclear Operators (WANO) are industry organizations that conduct internal peer reviews of safety standards and operations at nuclear facilities. The IAEA offers International Physical Protection Advisory Service (IPPAS) missions that review a country's laws and regulations on nuclear security. However, IPPAS missions are only conducted upon a country's request, and the information usually is kept confidential.

The CoEs can develop draft guidelines for information exchanges that can be reviewed by their individual governments. Once those milestones are passed, the CoEs can be authorized to begin discussions among their network on the findings, opportunities, and limitations of their individual efforts in this area. The final phase would be to develop a common set of information sharing standards that is more aggressive than that which exists today. As an information sharing system is developed, implemented, and tested, the feedback will provide important indications of whether the process can sustain more information sharing and how valuable the information being shared has been for improving international confidence in the global nuclear security system.

Simulation

One way to test the policy options for information exchange, and also other areas, is to utilize the CoEs as simulation test beds. It is fairly common in the national defense area to use simulations and table-top exercises to evaluate policy options and test hypotheses under simulated real world conditions, but the process also has been used in other non-military areas. Table-top exercises on technical issues already are being conducted at some of the Asian CoEs, and there may be other opportunities to use this approach in the policy area too.

In the information sharing realm, the simulation could include exercises of how a partner or adversary could exploit specific types of information to their benefit. Simulations also can be used to determine the degree to which specific types of information, if shared, could increase international confidence. The results of these exercises can provide tangible data on how to balance the information sharing equation. They also could be expanded bilaterally or regionally.

Further, table-top exercises also can be used to test the value of new and innovative security practices and policies and vet training materials' relevance to real world scenarios. An interesting example of the use of simulation for training purposes is the in the medical field. "Smart hospitals" are facilities that are 100% dedicated to training new doctors, nurses, and administrators, but house no actual patients. The facilities allow trainees from all medical disciplines to learn from each other and to develop new ways of communicating about and implementing the best possible care. This type of education and training is effective in part because without live patients to care for, trainees can reflect on situations, decisions, communication and mistakes. Absent real emergencies and the unpredictability of working and training in a hospital, trainees have the opportunity to gain confidence, ask questions, and explore alternative approaches to situations. The CoEs could adapt this model to develop a "smart security" concept.

Peer Review

The existing peer review system for nuclear security is implemented by the IAEA. It is valuable, but it also is voluntary and largely confidential. This system is unlike the nuclear safety peer review process where nations are mandated to produce periodic reports and other governments review them and make recommendations. Also, the IAEA may not have sufficient manpower to perform significantly more peer reviews per year under current circumstances. This raises two policy issues for the CoEs to consider.

The first issue is whether the current IAEA system is adequate when compared to other peer review regimes and what further steps could be taken by the IAEA to improve the process and enhance international confidence. There is no guarantee that the IAEA would accept outside recommendations, as they would need to be approved by the member states, but there is a value in having an authoritative assessment of what additional actions could be taken and what the benefits of them would be.

The second policy relevant issue is the possibility of supplementing the IAEA peer review with a regional peer review system. There are examples of multilateral approaches to nuclear monitoring and evaluation, including in Latin America and the European Union. But, there is at present no formal, regional peer review process in place for nuclear security. Such a process would need to be developed and could draw from a number of the other suggestions in this paper, such as the determination of what information can be shared, use of remote monitoring, and employment of best practices and standardization. Its development potentially may be difficult and slow, but outlining the concept for what an effective regional peer review system should be would have significant value as a starting point. Once its elements are identified, it can be assessed by governments and relevant experts and provide a starting point for a discussion about how it could be implemented.

Best Practices and Standardization

The NSS process has highlighted the lack of international standards in nuclear security. Whereas countries have made commitments to improve their own regulatory frameworks, implementation, and detection capabilities, there has not been a broad-based effort to establish and enforce common international standards to which all nations would adhere. The Hague gift basket on Strengthening Nuclear Security Implementation was an effort to get summit participants to agree to implement all of the relevant IAEA nuclear security recommendations. Thirty-five nations agreed but a number of others did not. This indicates a level of opposition to even the semi-universalization of the IAEA recommendations.

Still, it is clear that global nuclear security would benefit from the development of a common set of objectives and best practices beyond the universalization of the existing elements of the nuclear security regime. But, these nuclear security approaches need not be one-size-fits-all. There should be common performance standards, but the implementation of those objectives should be individually determined by each nation. In this circumstance, however, it will be important for nations to observably demonstrate that their actions meet the performance criteria. The use of performance objectives is common in other industries and professions.

Developing the categories of common standards should not be difficult, as the IAEA guidelines and related documents provide a roadmap. But, the process of providing sharable information and observable implementation are areas where the CoEs can play an important role. The process can begin with the voluntary actions identified at The Hague NSS, but it needs to lead to new norms of international behavior that ultimately are universalized. This would be a significant advancement in the concrete progress on global nuclear security.

Observable Confirmation

The ability to provide confidence without intrusiveness is a critical policy challenge in the nuclear security area. Remote monitoring and video confirmation provide "observable confirmation" of best practices and security implementation without the intrusion of in-depth transparency. The policy relevant aspect of this issue is in the examination of how it can be creatively applied to the challenge of assuring that high levels of security, training, and vigilance are being applied in nations and how that can strengthen global confidence in nuclear security.

Remote monitoring is a real-time video and uplink technology that allows a room, building, or activity to be monitored from afar. It has been used as both an adjunct to and a substitute for on-site inspection between nations. It has been used to some degree in U.S.-Russian nuclear security projects and domestically in the United States, but its future value in the nuclear security area has been largely untapped. Video confirmation is a similar technology, but this type of monitoring is not real-time and the video usually is provided at a later time to confirm an action. In the U.S.-Russian context, it has been used to provide proof of the implementation of specific activities where intrusiveness is not acceptable because of sensitivities.

The CoEs could test these concepts within their own facilities to determine how they might work best and where challenges need to be addressed. They then could be expanded on a regional or bilateral basis, focusing at first on non-sensitive facilities or activities. Past implementation of these technologies and approaches has shown that as comfort levels grow, the scope of the “observable confirmation” can also expand. This is a policy-technical fusion issue where the CoEs can make a significant contribution.

Certification

In addition to being a coordinating mechanism and centralized repository for technical expertise, the CoE network could develop and help to define a certification system for personnel. At present the process for vetting nuclear employees around the world is uneven, and this raises concerns and vulnerabilities. Personnel reliability is essential to minimize the potential for insider threats.

There are two dimensions of this challenge: 1) the accreditation of courses and criteria for employee training; and 2) the certification of employee qualifications and reliability so that it is accepted across borders. The CoEs could develop standardized education courses for aspiring and existing nuclear security professionals and engage experts on continuously adapting the curriculum.

The World Institute for Nuclear Security (WINS) is a nongovernmental group that has developed numerous best practice guides on a wide range of nuclear security topics and has successfully engaged the nuclear industry in the guides’ development and implementation. WINS Academy is a new, online certification course that offers a core curriculum and electives in different professional areas, from emergency response personnel to management. CoEs could complement this curriculum with in-person training exercises or invite WINS-certified professionals to joint exercises. The certificates could become an internationally recognized seal of approval.

Expert Development, Communications, and Outreach

The value of any CoE exists not only in its deep technical expertise and the practical experience of its staff, but also in its ability to cultivate a new generation of experts and to communicate about their work within their organization, with government officials, other CoEs and experts, and with the public.

One obvious direction for this effort by the CoEs is to engage and network with the universities in their individual nations. Once established, this engagement process can be extended to allow the exchange of students between CoEs and other institutions.

A further expansion of this proposal is to engage with the diplomatic training academies in countries. The diplomatic corps of most nations usually is shuttled to different regional and substantive assignments, but CoEs could contribute to their training by working on curricula, housing students for a short period of time, and lecturing on the important aspects of nuclear technology and policy.

A now commonplace approach to communication around the world, but one that is not employed in the nuclear security arena, is the use of mobile platform applications (app). In 2014, summit organizers created an app that participant delegations, journalists, and experts could use to better understand the events taking place and have immediate access to information as the summit progressed. Large-scale conferences in other fields also have taken to using mobile apps to connect with participants to make information exchange and data storage easier and ensure that participants can communicate with each other after events are over.

The development of a mobile app can add an important new dimension to the work of the CoEs. How the various centers are communicating is somewhat opaque because each is independently run and all have unique structures. Easy to understand information on things such as significant activities and training offerings could be made available on the mobile app.

A CoE app would allow staff at facilities in each of the CoEs to send data about their center to interested parties who download the app as well as follow the activities of the other centers. Sensitive data would not be shared over this network, and restrictions and privacy terms for the app could be developed. Nuclear industry professionals, policymakers, and regulators as well as IAEA officials and nuclear-focused academics, students, and researchers from around the world could use this application to better communicate and share new developments. The app could also be used to improve transparency with the public.

Conclusion

The commitment to create CoEs as a part of the NSS process is one of the summit's most significant and lasting legacies. But, the opportunity that the CoE concept offers extends well beyond purely technical issues and training. There are a number of policy issues and technical issues with important policy dimensions that CoEs also can address. Further, the CoE network can play an important role in laying the groundwork for continued progress in nuclear security after the summit process ends in 2016.

These are facilities where significant investments have already been made and work must continue to ensure they institute well-rounded programs and encourage communication across borders and disciplines. Scientific cooperation has long been an area that has transcended temporary disputes between nations. The CoE network should be an important continuation of this tradition.

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