



## Centers of Excellence in East Asia: Encouraging Collaborative Approaches to Nuclear Security

Given the surge of nuclear security initiatives following the launch of the Nuclear Security Summit (NSS) process in 2010, attention has naturally turned to assessing the progress made over the last five years. This brief seeks to examine the role and impact of the national centers of excellence (COE) for nuclear security education and training that have been established or are in the process of being established in East Asia.<sup>1</sup> The authors assess ways to improve coordination among the COE and how, as the centers evolve, they might play a greater role in improving transparency, building international standards, and coordinating policy.

Countries establishing COE or nuclear security support centers sponsored by the International Atomic Energy Agency (IAEA) include mature nuclear powers as well as those thinking of entering the game for the first time. This brief outlines the current and future roles of seven COE in six East Asian countries: China, Japan, Indonesia, Malaysia, South Korea, and Vietnam.<sup>2</sup>

East Asia is a region rife with security challenges that could either facilitate collaboration or promote discord among countries. These range from terrorism to great-power confrontation in the South China Sea—the latter an issue that has traditionally made collaboration on international security issues difficult. These myriad challenges and opportunities—besides many other factors that will be explored below—have impacted on the cooperation between the region's COE. This brief thus also examines prospects for further interaction between the COE, with a focus on the centers in China, Japan, and South Korea.

In considering the centers' future activities and opportunities for enhancing collaboration between them, the authors suggest the following guiding principles and practical recommendations:

- The centers as they exist in their current form have neither the capacity nor mandate to fulfil a high-level policy role. Before COE can contribute to nuclear security policy development, they need to establish a track record in their primary areas of focus: education, training, and the provision of technical services.



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- The centers in East Asia should be encouraged to increase their collaboration on nuclear security education and training activities and engage in certain policy-related activities, which could include:
  - **Conducting policy-relevant research.** For example, research into different types of radiation detectors and means of operating them could affect how national policymakers decide to deploy them. Drawing on their technical expertise, the centers could also provide a significant contribution to other international nuclear security initiatives, such as the Global Initiative to Combat Nuclear Terrorism. Here centers could take the lead in designing hypothetical facilities or scenarios for use in tabletop or other exercises.
  - **Promoting consistency in policy tools and approaches.** For example, there is potential for the centers of the East Asian region to—through their research—feed into new and revised guidance documents under development at the IAEA. The efforts of the Center for Security Culture and Assessment in Indonesia on security culture self-assessment is a good example of how this can work. In addition, consistent standards, and adherence to them, could be tested through a COE regional peer-review mechanism, possibly beginning with an effort to review education and training efforts at the centers.
  - **Encouraging transparency.** For example, the COE, working with the relevant national contact point, could help improve the quality and frequency of nuclear-security-related reporting and information sharing to formal initiatives, such as UN Security Council Resolution 1540 (2004), and informal efforts, such as the Proliferation Security Initiative or the Code of Conduct on the Safety and Security of Radiological Sources. In the area of human resources and capacity building, an effort to collate information on past and ongoing efforts would be useful. The process could essentially take the form of a crowd-sourcing effort among the centers and other training institutions (say universities) and providers, perhaps led by a third party.
  - **Building collaboration with other relevant organizations, such as universities and think tanks.** The COE would certainly benefit from building relationships with these organizations, as it would allow them to further policy-relevant research activities and add another dimension to their training efforts.
- Consideration of how to overcome broader political schisms in the region that have some impact on collaboration between the COE must be central to any plans to promote regional cooperation. In particular, the difficulties are most acute, and the potential benefits would be most welcome, in overcoming these regional political rifts in engagement between the larger centers—the Chinese center and the COE in Japan and South Korea.

## Human Resource Development in Nuclear Security

The security of nuclear and radioactive materials, related facilities, and sensitive information has risen to the forefront of the international agenda over the past decade. The Nuclear Security Summits in 2010 in Washington, 2012 in Seoul, and 2014 in The Hague saw governments pledge to take steps to mitigate the threat posed by nuclear terrorism and report on their progress. The NSS process has facilitated the adoption of new nuclear security legislation at the national level, improved security at nuclear and radiological facilities, the consolidation and removal of nuclear materials, and the conversion of research reactors to run on low-enriched uranium fuel.

Within the summit process and outside of it, the human element has been recognized as a key factor in strengthening nuclear security systems. The number of individuals at nuclear sites with accountability for security means that there is a serious demand for nuclear security education and training—studies also reflect this need for capacity building. In 2013, the World Institute for Nuclear Security (WINS) estimated that while 230,000 professionals have responsibility for nuclear security worldwide, current professional-development opportunities only have the capacity to train and educate just over half these individuals.<sup>3</sup> Given this gap, a wide range of activities has been undertaken in this area, including the publication of best-practice guidance documents, as well as the development of new education and training programs, associated accreditation mechanisms, and methodologies for assessing and enhancing nuclear security culture. A number of countries have established or are in the process of establishing centers to serve as hubs or coordinating mechanisms for providing nuclear security training, education, and technical services to a range of relevant stakeholders, including facility managers, regulatory staff, scientists, engineers, or technicians.<sup>4</sup>

The concept of national centers supporting human resource development in nuclear security is not new and predates the NSS process. The IAEA has been working with states since 2007 to establish nuclear security support

centers (NSSCs) “to facilitate the development of human resources and the provision of technical and scientific support.”<sup>5</sup> The NSSC model emphasizes sustainability in order to ensure the effectiveness of national nuclear security measures over the long term. Another key actor at the international level is the European Union, which launched a chemical, biological, radiological, and nuclear COE program in 2010 aimed at assisting states in mitigating proliferation and security risks.<sup>6</sup> The program intends to create a network of experts, facilities, and training areas, and it funds human capacity-building projects in the area of nuclear security.<sup>7</sup> At the subnational level, dozens of universities have also developed and launched new educational courses in nuclear security, from stand-alone modules to full master’s-level programs. Nongovernmental organizations have also been involved in delivering courses and workshops.

Due to the considerable amount of work being conducted in this area by different international, national, and nongovernmental organizations, thought must be given to the most efficient use of resources and how to avoid duplication of activity. Also, with the 2016 NSS in Washington likely being the final one, it is timely to consider how the sustainability of these efforts can best be ensured so that capacity building continues long after the summit process ends. With a number of centers of excellence under development and some already operational in East Asia, the region presents an interesting case for consideration. The activities COE are currently undertaking, the types of cooperation and coordination under way, and the roles COE might take on in the future are examined below.

## The East Asian Centers of Excellence

Rising demands for energy in East Asia have placed the region at the center of the nuclear renaissance. Most new-build reactors planned around the world will be in this region. The IAEA reports that new power reactors are under construction in China (25), Japan (2), South Korea (4), and Taiwan (2).<sup>8</sup> Other countries in the region are also developing proposals for nuclear power programs, including Indonesia and Vietnam.<sup>9</sup> The IAEA notes that in the East Asian region, 33 power reactors are under construction—almost half of the 68 reactors under construction around the world.<sup>10</sup>

The region already has a sizable nuclear and radiological workforce, with a needs-assessment study by WINS noting that Asia (including the Middle East) has around 100,000 professionals with some level of “accountability” for nuclear security.<sup>11</sup> The study also notes:

“Due to the large number of countries in the region, Asia is the global leader for offsite professional development for such roles as emergency response services, regulators and border guards. In fact, the demand for offsite training comprises approximately 16,000 professionals. Asia also has the largest number of medical institutes and oil and gas companies using radioactive sources.”<sup>12</sup>

Given this backdrop of growing training needs and a strong policy focus on preventing nuclear terrorism through the high-level politics of the NSS process, it is not surprising that China, Japan, and South Korea pledged to develop nuclear security COE at the 2010 Washington NSS (see Table 1 for

**Table 1: The East Asian Centers**

Country	Center	Parent Entity	Key Dates	Geographical Focus	Topic Focus	Activity Focus
<b>China</b>	State Nuclear Security Technology Center (SNSTC)	China Atomic Energy Authority	Pledged at 2010 NSS; joint memo with US signed in 2011; foundations laid in 2013; expected to complete construction in 2015	Mostly national; possibly at a later point the Asia-Pacific region <sup>14</sup>	Nuclear security	Technological exchange, education, training <sup>15</sup>
<b>Indonesia</b>	Center for Security Culture and Assessment (CSCA)	BATAN (operator)	Inaugurated in Sept. 2014 <sup>16</sup>	National; first regional event in 2015 <sup>17</sup>	Nuclear security culture/assessment	Self-assessment, planning, awareness, training, international collaboration
	Indonesia Center of Excellence on Nuclear Security and Emergency Preparedness (I-CoNSEP)	BAPETEN (regulator)	Inaugurated in 2014 <sup>18</sup>	National, later moving to regional and international <sup>19</sup>	Nuclear security, safety, emergency preparedness	Policy, technical and scientific support, training, development of safety and security culture, optimization of resources <sup>20</sup>

**Table 1: The East Asian Centers (continued)**

<b>Japan</b>	Integrated Support Center for Nuclear Nonproliferation and Nuclear Security (ISCN)	Japan Atomic Energy Agency (JAEA)	Pledged at 2010 NSS; established Dec. 2010; began offering courses in 2011	Japan, Asia, and "other regions" <sup>21</sup>	Nuclear security, nonproliferation, safeguards	Capacity-building assistance, assistance for infrastructure development, technology development and support, technical support to government <sup>22</sup>
<b>Malaysia</b>	Nuclear Security Support Centre (NSSC)	Atomic Energy Licensing Board (regulator)	Recognized by IAEA in 2012 <sup>23</sup>	National, regional	Nuclear security	Sharing best practices, information sharing
<b>South Korea</b>	International Nuclear Security Academy (INSA)	Part of the Korea Institute of Nuclear Nonproliferation and Control (KINAC); sits under Nuclear Safety and Security Commission (regulator)	Pledged at 2010 NSS; started construction in 2012; started operation in 2014	National, regional, global <sup>24</sup>	Nuclear security, nonproliferation, safeguards, export controls	Education, training, provision of expertise, awareness raising <sup>25</sup>
<b>Vietnam</b>	Nuclear Security Support Centre (NSSC)	Part of Vietnam Agency for Radiation and Nuclear Safety (regulator)	Joined the NSSC Network in 2014 <sup>26</sup>	National	Nuclear security	Education and training

key dates in the establishment of the centers). Commercial drivers, or at least the possibility of financial benefits down the road, may also have played a role in these decisions. Nuclear-supplier states such as China, Japan, and South Korea are increasingly keen to provide a full package of technology and human resource expertise to emerging nuclear countries. Within Southeast Asia, a good example of this is Vietnam, which has the most developed nascent nuclear power program in the region. Vietnam's contracts with Russia and Japan to build its first two power plants have been accompanied by training of nearly 500 students and engineers in Russia and 1,000 operator staff in Japan.<sup>13</sup> While the numbers quoted are for the development of engineering and technical skills, a demand for nuclear security training is likely to follow as Vietnam's nuclear energy program develops.

Other training centers have been established in the region in addition to those pledged by states at the 2010 summit. Vietnam and Malaysia, working with the IAEA, have established NSSCs. Indonesia has established two centers: the Center for Security Culture and Assessment (CSCA) at the operator (National Nuclear Energy Agency of Indonesia, or BATAN) and the Indonesia Center of Excellence on Nuclear Security and Emergency Preparedness (I-CoNSEP) at the regulator (Nuclear Energy Regulatory Agency of Indonesia, or BAPETEN).

## The Diversity of the Centers

Of the seven centers in the region, six are fully operational or have been inaugurated, and the physical facilities of one (the Chinese center) are due to be finished in late 2015. The makeup of the centers differ considerably as a result of both their genesis—set up around the NSS process with the support and guidance of the IAEA or driven forward by national priorities—and the specific needs of different countries. The centers have, or will have, different geographical and topic focuses, conduct different types of activities, and serve different target audiences.

In sum, three broad types of centers are observed in the region in terms of topic area:

- Some centers are seeking to take a comprehensive approach to nuclear security (for example, China, Malaysia, and Vietnam), launching activities across a range of key areas, including introductory nuclear security training, physical protection, and the use of detection technology (see Table 2 for more examples on training types).
- Other centers, while perhaps conducting some general activities, focus specifically on a particular aspect of

**Table 2: Types of Training Offered by the Centers<sup>28</sup>**

Center	Education and Training Offered	Target Groups
SNSTC, China	Training courses conducted with IAEA support before center inaugurated in 2015; likely more technical in nature	Largely domestic <sup>29</sup>
CSCA, Indonesia	Awareness training and education (2014, 2015 events) on gap analysis, performance testing: detection, performance testing: delay and respond, physical security measures for radioactive source or nuclear material, self-assessment on nuclear security culture, vulnerability assessment <sup>30</sup>	In-house (BATAN staff) /regional
I-CoNSEP, Indonesia	Course on fundamentals of nuclear security (first run 2014) <sup>31</sup>	Largely domestic; stakeholders: BAPETEN, BATAN, police, customs, Ministry of Foreign Affairs, intelligence, others <sup>32</sup>
ISCN, Japan	Courses from 2014 in nuclear security: preventing and protective measures against insider threats; protection and prevention measures against sabotage of nuclear materials and nuclear facilities; information disclosure, assurance, and insider threat; physical protection; physical protection detection system performance; nuclear security culture; nuclear forensics <sup>33</sup>	Officials/personnel from regulatory bodies, nuclear operators, radioactive material licensees, police and coast guard <sup>34</sup>
NSSC, Malaysia <sup>35</sup>	Training courses for front-line officers and technical support teams include introduction to radiation, introduction to weapons of mass destruction, overview of radiation portal monitors alarm-response procedure, hand-held equipment, software training, secondary inspection, technical maintenance of equipment	National enforcement agencies, Royal Malaysia Police, Royal Malaysia Customs and Excise Department, Malaysian Maritime Enforcement Agency, regional partners <sup>36</sup>
INSA, South Korea <sup>37</sup>	Courses from 2014 training schedule: multiple courses on basic nuclear security, physical protection, physical protection for security personnel, advanced course on physical protection	Nuclear regulators/inspectors and facility personnel (international and domestic)
NSSC, Vietnam <sup>38</sup>	Courses from 2014 training schedule: multiple courses on basic nuclear security, physical protection, physical protection for security personnel, advanced course on physical protection	Enforcement agencies, guards, facility personnel

nuclear security (for example, the centers in Indonesia, which focus on security culture and emergency preparedness respectively).

- Some centers have been given a broader remit, which can include the related areas of nonproliferation, safeguards, and export controls (Japan and South Korea).

The centers also vary in terms of their parent entities. The type of parent entity in the Asian centers varies from operator (for example, the CSCA in Indonesia) to regulator (for example, the I-CoNSEP in Indonesia) to relevant government agency (for example, the Japan Atomic Energy Agency's ISCN). The reasons for this variation may be political and/or reflect the concentration of nuclear security expertise within a particular country. The involvement of different types of parent entities can affect the focus, facilities, and activities that a particular center undertakes.

In terms of type of activity, the centers are currently focusing largely on technical training, for example, relating to detection technologies or nuclear forensics. Table 2 provides a summary of the types of training provided by the centers, in some cases including examples of recent course topics and target groups.<sup>27</sup>

It is apparent from the subject matter of the courses that much of the training work of these centers is targeted at practitioners. These are individuals responsible for implementing and regulating nuclear and radiological security at the facility and state levels, for example, those involved in coordinating emergency preparedness and response roles.

In some cases the narrow and technical training remit (in areas such as radiation protection and detection) that was initially envisaged for some of the centers has expanded slightly to include other key topics, such as protective and

preventative measures against insider threats, information security, and nuclear regulation. Security culture is also becoming more prominent in training efforts as security managers and others seek to understand how they can assess and strengthen the human factor within their organizations. This shift is reflected in the Indonesian CSCA that focuses exclusively on this issue.

## Achievements and International Collaboration

The achievements of the centers and the manner in which these achievements are judged nationally and internationally will vary depending on the purpose and context in which they were established. Existing cooperation between the COE also needs to be considered in the context of broader endeavors to encourage cooperation in the area of nuclear security education and training. Here efforts by the IAEA are of particular significance, having supported the establishment of two key forums: the International Nuclear Security Education Network (INSEN) and the International Network for Nuclear Security Training and Support Centres (NSSC Network).

The INSEN is focused on supporting the cooperative development of new academic programs in nuclear security. It was established in 2010 and now has more than 250 members from 133 institutions, primarily universities and research institutes, from 49 countries.<sup>39</sup> With the support of the IAEA, members have worked collaboratively to coauthor textbooks and teaching materials and to provide development opportunities for educators working at an undergraduate and graduate levels. Members have also partnered using this forum to offer joint programs, such as the European Union masters program in nuclear security, launched in 2013.<sup>40</sup> Given the breadth and interdisciplinary nature of nuclear security, the collaborative development of nuclear security educational resources has been essential in supporting universities in launching new courses in this area.

The NSSC Network was established in 2012 to focus on collaborative approaches to training and the provision of technical services. As of 2014, it had 58 member institutions from 49 countries.<sup>41</sup> This network links institutions involved in nuclear security training beyond those that are formally IAEA-supported NSSCs. The NSSC Network includes the IAEA-endorsed NSSCs in Vietnam and Malaysia, as well as the COE in China, Japan, Indonesia, and South Korea, despite them not being established as IAEA NSSCs. There is some collaboration between these two networks, although this is at a nascent stage.

There is no one metric by which the achievements of COE can be compared, but an idea of their effectiveness can be built by considering their training activities. The role of the IAEA is important here, as its Division of Nuclear Security

is highly active in providing training courses, running 108 and training almost 3,000 people in 2014 alone.<sup>42</sup> Many of these involve expertise drawn from various COE. The center in China, for example, although not fully operational, conducted “20 seminars and training courses for over 500 nuclear security staff, including 100 from a dozen countries in the Asia Pacific region” from 2010 to 2012.<sup>43</sup> From 2012 to 2013, those involved with the Chinese center hosted over 300 participants from 18 countries at 11 IAEA-endorsed courses (where the agency has reviewed material to check it is consistent with IAEA guidance).<sup>44</sup>

As of 2014, the Japanese center claims to have provided training “on peaceful uses of nuclear energy and training courses on physical protection to more than 1,500 experts from both home and abroad.”<sup>45</sup> The South Korean center plans to provide training to 1,000 people per year.<sup>46</sup> The NSSCs have performed similar activities. In 2012, the Malaysian NSSC organized four training courses for 80 front-line officers, produced local guidance documents, and trained ten nuclear security trainers.<sup>47</sup> These figures suggest that the centers are having a real tangible impact on nuclear security capacity in the region.

Levels of collaboration between COE, however, are perhaps more difficult to gauge. Here it should be noted that the concept of collaboration could encompass many different types of activity, from personnel from different centers participating in training courses to longer-term exchange of personnel to regular meetings and exchanges—even to sharing curricula and materials. Beyond this bilateral collaboration, the COE have also collaborated with multiple partner organizations. The centers are often keen to emphasize that collaboration is occurring, and this may lead to the extent of collaboration being exaggerated, which in turn makes it difficult to understand the depth and scope of these activities.

At the individual level, COE personnel have participated in courses held by other regional centers. However, it is not unusual for professional-development courses or training workshops to include international participants, so this form of collaboration, although valuable, should not be exaggerated.

In contrast, more strategic-level collaboration in the area of nuclear security has been slower. There were hopes that a joint statement on cooperation between the Asian centers would be made at the Seoul summit, although these were unfounded. Instead a Joint Statement on Nuclear Security Training and Support Centers was made; of the East Asian COE, it was signed by Japan but not China or South Korea.<sup>54</sup> This may have been because the Chinese and Korean COE were not ready to collaborate or because competing priorities during the summit (for example, other initiatives or gift baskets being viewed as more important and hence worthy of attention) meant the statement was overlooked.<sup>55</sup>

**Table 3: Regional Collaboration Between the Centers**

Center	Regional Collaboration
China	Japan and South Korea (Asian Network) South Korea (exchange of training materials planned) <sup>48</sup>
Indonesia	CSCA has collaborated with regional partners in trials of the recently developed IAEA security culture self-assessment guidance
Japan <sup>49</sup>	China and South Korea (Asian Network) South Korea (participation in training courses, personnel exchange) Vietnam (seminar in Hanoi) <sup>50</sup> "Many other" Asian countries <sup>51</sup>
South Korea <sup>52</sup>	China and Japan (Asian Network) China (exchange of training materials planned) Indonesia (personnel attended training at INSA) Malaysia Mongolia Myanmar Philippines Thailand Vietnam
Malaysia	
Vietnam <sup>53</sup>	Memorandum of understanding (MOU) with JAEA, Japan (2010) MOU with KINAC, South Korea (2013)

In a more positive development, an Asian regional network, which meets every four months on the sidelines of NSSC Network meetings, was set up between the centers in October 2012.<sup>56</sup> The centers in China, Japan, and South Korea send senior representatives to present and discuss their work. A devoted page has been set up on the NSSC portal to allow the East Asian COE to more easily share materials. However, despite this positive development, when it comes to regional collaboration, nuclear security still lags behind nuclear safety, although this is by no means unique to East Asia. Safety issues are far less politically charged and, since Fukushima in 2011, have received significant attention in the region. Since 2008, the three countries' top safety regulators have convened annually at a series of meetings. In 2011, the three countries signed a Cooperative Nuclear Safety Initiative that pledged cooperation in "regional nuclear safety standards, regional emergency response mechanism and regulatory capacity."<sup>57</sup>

While collaboration between the centers is taking place on security issues, it would appear this is more at the working than the strategic level. That is perhaps not surprising, given the typical conflation of nuclear security with broader nuclear-weapons-related issues and a background of rivalries and tensions that exist in Asia over China's rise and territorial disputes in the South China Sea. These tensions have clearly had an effect at the higher political level where a mandate for further cooperation on nuclear security issues would have to be signed off. However, at the working level, COE representatives indicate that the centers are keen to collaborate.

### Ensuring Relevance and Sustainability: The Future of the Asian Centers

The future role of the COE has been hotly debated, with some analysts arguing that there is potential for the East Asian centers to take on a more formative policy role after the final NSS in 2016. This section will consider the meaning of sustainability in the COE context and the feasibility of a policy role for COE before making recommendations regarding the future of the Asian centers.

The basis of the IAEA's NSSC model is the "long-term sustainability of nuclear security capabilities."<sup>58</sup> The process of establishing an NSSC starts with a detailed, country-level needs assessment, which highlights specific nuclear security areas where expertise is currently lacking. This is then built up at the local level so that education and training programs in these areas can be offered domestically. Later, once this expertise has matured, local technical services are also offered.

This bottom-up, step-by-step approach is arguably in contrast to the COE model represented in this context by the centers in China, Japan, and South Korea. Critics have argued that the COE have been established to meet political NSS objectives with little consideration for their need, the potential for duplication with other initiatives, or their longer-term sustainability.<sup>59</sup> Given how the COE were conceived, it is perhaps unsurprising that analysts are considering what role if any they might play in policy development.<sup>60</sup>

It is important to assess what a policy role might constitute in this context, especially since nuclear security policy is developed and implemented at a number of levels. These include the so-called high level by heads of state, at the working level by government departments, and at the technical level by regulatory agencies, implementing bodies, and industries. Generally speaking, the higher the level at which policy is created or endorsed, the farther up the chain it is from the technical specificities on which it is founded.

The centers have been featured as significant parts of the national pledges and statements by the heads of state at the high level at the nuclear summits. However, in terms of their current activities, the centers are working on policy issues mostly at the technical level and using their conclusions to inform the working level. While it may be desirable to have the centers play a greater role in the policy area, it is also important that policymakers are realistic regarding the extent to which this is possible. Judgments of feasibility should be based on current activities and strengths. Having considered the limitations of potential policy roles for the COE above, there are some steps the centers could take to ensure sustainability and maximum impact in capacity building. These recommendations fall into four main areas: conducting policy-relevant research, promoting consistency, encouraging transparency, and engaging other stakeholders.

### Conducting Policy-Relevant Research

The centers that are conducting research will likely be in a position to contribute to policy in some way, even when the research is limited to narrow and technical areas. For example, research into different types of radiation detectors and means of operating them could affect how national policymakers decide to deploy them. Drawing on their technical expertise, the centers could also provide a significant contribution to other international nuclear security initiatives, such as the Global Initiative to Combat Nuclear Terrorism. Here centers could take the lead in designing hypothetical facilities or scenarios for use in tabletop or other exercises.

Statements by those working at some of the centers—those in China and Japan, for example—suggest that broader policy-based research may be involved in the centers' work. For example, a speech at the IAEA Ministerial Conference in 2013 by an official associated with the Chinese center noted that the center would "carry out [research] on nuclear security policy regulation and technical codes."<sup>61</sup> However, currently this constitutes a minimal part of the centers' roles given other functions. In contrast, the South Korean center has been established in such a way that makes it more conducive toward accommodating a broader policy focus, having both education and research dimensions.<sup>62</sup> An annual forum hosted by INSA and its parent organization, KINAC, in 2014 included discussion of high-level nuclear security policy issues.

Another example where a center might influence high-level policy is the work of the CSCA in conducting trials of the IAEA's draft nuclear security culture self-assessment methodology at BATAN's research reactors. This process has fed back into the IAEA's draft guidance and has enhanced broader international understanding of nuclear security culture. The CSCA is also sharing its newly gained expertise in international forums and by assisting other countries in conducting self-assessments.

This perhaps shows that there may be more potential for policy-relevant research to have an impact when it comes to work in more-focused and lesser-explored areas of nuclear security. Besides providing broader insight into security culture, the CSCA's work provides insight into how self-assessment might be conducted at research reactors and associated facilities, and in countries with developing nuclear infrastructure.

### Promoting Consistency

Some experts have suggested that that COE could play a role in promoting consistency. Consistency within the nuclear security regime is certainly desirable in theory, although it is difficult to achieve in practice with no strong overarching international legal framework.<sup>63</sup> Policy impact in this respect would involve the East Asian centers operationalizing the fruits of their research to develop common approaches in one or more of these three main areas:

- Standards.
- Guidance (on how to implement measures that meet the standards).
- Certification, accreditation, and professional development (benchmarking skills and competency).

It is clear that the centers have some interest in promoting consistency in nuclear security approaches, with evidence of materials being shared between them.<sup>64</sup> However, it should also be noted that such sharing is occurring in an ad hoc manner and at the bilateral level, without standardization or peer review. Here consideration must also be given to the traditional role of the IAEA in developing international standards and recommendations for nuclear security through its Nuclear Security Series publications, which are widely followed by nations.<sup>65</sup> Other efforts to codify best practices conforming with IAEA guidance have been made by industry bodies such as WINS. Consequently, work by COE in this area risks duplication of effort, or the creation of guidance that conflicts with existing documents. Consequently, these documents should be used as the basis on which COE may build. There is also clearly potential here for the centers of the East Asian region to—through their research—feed into new and revised guidance documents under development at the IAEA. The CSCA's work on security culture self-assessment is again a good example of how this can work.

In addition, consistent standards, and adherence to them, could be tested through a COE peer-review mechanism. For example, the centers could be involved in exchanges where the security at facilities in other countries is assessed. However, the challenges of establishing a framework and overcoming information sensitivities to undertake peer review cannot be understated. An advantage that the IAEA has as



a reviewer (for example, through the International Physical Protection Advisory Service) is that as a UN organization, it is viewed as a relatively neutral actor. In fact, it may be easier to establish peer-review mechanisms between countries in different regions than between regional neighbors and just as beneficial in improving nuclear security.

A less-sensitive area where peer review could be desirable and easier to implement in practice is review of education and training efforts at the centers. This could link to certification and accreditation of trainers, curricula, and assessment. There is currently no internationally recognized standard for accreditation in nuclear security training, although the recently launched WINS Academy is pioneering an international certification program.<sup>66</sup>

### Encouraging Transparency: Benchmarking Nuclear Security?

Another potential role for the centers revolves around promoting increased transparency, with recent efforts exploring what information can be shared in the nuclear security context given intrinsic information-security concerns.<sup>67</sup> Transparency in nonsensitive areas brings clear advantages: It can allow security to be benchmarked against international standards, enable more realistic needs assessments, and may even deter potential adversaries.

Some limited efforts have been made to benchmark states' nuclear security. The Nuclear Threat Initiative Nuclear Materials Security Index is probably the most prominent example. It was first published in 2012 and updated in 2014.<sup>68</sup> Transparency—or at least the country in question striking a good balance between transparency and information security—was included as a positive indicator of nuclear material security in the 2012 version (as part of the study considering indicators relating to “global norms”), whereas in 2014, it was included in the study under the guises of “international assurances.”<sup>69</sup> However, benchmarking beyond this has been limited. With no universal and legally binding measures, states are not legally obliged to put in place many nuclear security measures recognized as good practices, let alone to report the measures put in place.

A similar lack of understanding regarding progress is seen with regard to states' obligations under UN Security Council Resolution 1540 (2004), a universally applicable and legally binding framework to reduce the threat posed by nonstate actors.<sup>70</sup> Even in the case of UNSCR 1540 implementation, which legally obliges states to report on implementation progress, reporting has been sporadic. Many of the reports have been of poor quality, and the matrices developed to compensate have been highly reductive.<sup>71</sup> The COE, working with the relevant national contact point, could help improve the quality and frequency of nuclear security related reporting and information sharing to formal initiatives, such

as UNSCR 1540, and informal efforts, such the Proliferation Security Initiative or the Code of Conduct on the Safety and Security of Radiological Sources.

In the area of human resources and capacity building, an effort to collate information on past and ongoing efforts would be useful. The COE—as key training organizations in this area, and drawing in experts from the region and around the world—are well placed to help realize this by logging their activities and identifying potential training gaps. Such an information-gathering process should be transparent in its means and objectives. The process could essentially take the form of a crowdsourcing effort among the centers and other training institutions (say universities) and providers, perhaps led by a third party.

Efforts to promote transparency do not come without difficulties, especially in East Asia. General difficulties surrounding sensitive nuclear information have already been explored. More-specific regional difficulties include Chinese reservations surrounding the definition and scope of transparency—a word that is often used but seldom elaborated on.<sup>72</sup> It should be noted that any emphasis on *transparency* without clearly setting out potential parameters and the term's meaning in context is unlikely to entice China or the Chinese center to further collaboration.

### Engaging Other Stakeholders

If COE want to expand their role in policy, there is much to be gained from engaging other organizations. Many COE house personnel with a combination of technical and policy expertise, for example, personnel at the centers in Japan and Korea. However, it is less clear to what extent such policy-related expertise exists in the centers in China, Indonesia, Vietnam, and Malaysia. Some of the East Asian countries discussed host think tanks and universities that are already conducting work on nuclear security policy and other security issues. In China, for example, a number of government-affiliated think tanks work on security issues. In South Korea, the ASAN Institute has conducted significant work on nuclear security, especially in the run-up to, and following, the 2012 Seoul summit.

These institutes, as well as some universities in these Asian countries, have significant policy expertise. The COE would certainly benefit from building relationships with these organizations, as it would allow them to further policy-relevant research activities and add another dimension to their training efforts.

A couple of potential limitations should also be noted. Some of these institutes, particularly university departments that work on international security issues, may not have looked at nuclear security in any depth and may need encouragement to do so. Also, these institutes may lack the focus or capacity

in technical issues that COE have. Given the differing areas of expertise and facilities found in these organizations, perhaps partnerships between COE, universities, and think tanks (where capacity and expertise exist in different national contexts) would allow for the optimum harnessing of expertise to meet nuclear security needs at both technical and policy levels.

## Conclusions

The nuclear security COE and NSSCs suggest a bright future for nuclear security education and training in East Asia, a region that will certainly need significant capacity building in the coming decades. The issue of sustainability relates in some respects to the way the COE were established and their roles. While the IAEA NSSC model has sustainability at its heart, less thought has been given to sustainability of the COE, whose establishment has been driven by high-level politics of the NSS process. Sustainability of this and other efforts is now a paramount objective for those seeking to ensure nuclear security progress beyond the final 2016 NSS.

Most of the activities of the COE are currently focused on training and education to build capacity at the more technical level. While some of the centers do have slightly broader policy-related training and education functions, this is overshadowed by the more-technical training work they conduct. Suggestions that COE should play a more policy-focused role, and could in some way inherit the NSS process, have appeared daunting to those working at the centers. The centers have neither the capacity nor mandate to implement these suggestions. Before the centers could play more of a policy role, they would need to develop a recognized track record in what they were primarily set up to do: training and providing technical services.

Cooperation between the centers—especially those in China, Japan, and Korea—has not been as significant as was originally hoped by many. However, some efforts to work together have been observed, for example, through an Asian regional network established on the sidelines of the NSSC Network meetings. Although there are clear benefits in further cooperation at the technical level, regional tension and diplomatic difficulties may well hinder this at higher political levels. Consideration as to how to engage China and the Chinese center must be central to any plans to promote future regional cooperation.

The centers should be encouraged to focus on more-achievable policy-related activities: conducting policy-relevant research, promoting coherence in policy tools, encouraging transparency, and building collaboration with other relevant organizations, such as universities and think tanks. This could help increase cooperation and strengthen the nuclear security regime. Currently, though, it would be optimistic to expect that the centers would be able to fill the gap in the nuclear security regime left following the last NSS in 2016.

## Endnotes

<sup>1</sup>This policy brief draws on a paper commissioned for a workshop Collaboration Among Centers of Excellence in Asia organized by the Center for Strategic and International Studies (CSIS) Proliferation Prevention Program and the Stanley Foundation in cooperation with the Vienna Center for Disarmament and Non-Proliferation on October 8, 2014.

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