Education for a Safer World: Developing the International Nuclear Security Academy

By Hosik Yoo

The Washington Nuclear Security Summit in 2010 laid the groundwork for the establishment of international training and education centers to improve knowledge on non-proliferation and nuclear security issues.

As Hosik Yoo writes, South Korea has stepped forward with an ambitious plan to establish the International Nuclear Security Academy, with construction already getting under way.

GIVEN THE VERY REAL POSSIBILITY of nuclear terrorism occurring at some point in the future, most countries have strengthened their security systems in response, and there have been numerous efforts to improve nuclear security worldwide. Effective global measures require the capability to prevent, detect and respond to malicious acts against nuclear facilities. These capabilities should be developed systematically and be self-sustaining over the long term. This can be done by providing continuous, high-level training and education in nuclear security.

Although many experts have stressed the importance of nuclear security training, there has been a decided lack of systematic training programs. Like many nations, South Korea has been working to strengthen its own nuclear security regime by providing compulsory security training. However, the infrastructure for this training is very limited. That is why the pledge made by President Lee Myung-bak at the Washington Nuclear Security Summit in 2010 to establish an international training center on nuclear security is so important. Seven other countries at the summit also promised to build similar centers.

South Korea’s center, to be called the International Nuclear Security Academy (INSA), will aim to be a hub for Northeast Asia to enhance the skills of personnel already involved with nuclear security and non-proliferation. In addition, a test bed for both training purposes and experimentation on new equipment and instruments will be built at the center. Domestic and international training courses will be offered in various fields such as nuclear security, international safeguards and import and export control. The training center’s curriculum will be developed in collaboration with the International Atomic Energy Agency (IAEA) and the relevant authorities in the United States. In the near future, consideration will be given to organizing masters and doctoral courses.

VISION AND OBJECTIVES

The purpose of the INSA is to facilitate the nuclear security and non-proliferation training needs of personnel both domestically and internationally. It will be different from other training centers by virtue of the large-scale test beds that will be built. With its specialized and comprehensive training and educational programs and its testing facility, the center will contribute to international efforts to strengthen nuclear security through both skills development and research and development activities. Its goal is to enhance the nuclear security culture and become a leading hub for training and education in nuclear security and nuclear non-proliferation for the Asia-Pacific region. The overall objectives of the center are to:

• Provide customized and high-quality nuclear security and non-proliferation training and educational programs for Northeast Asia;
• Facilitate technical and scientific co-operation and assistance to emerging countries;
• Promote research and development activities on physical protection systems.

CONSTRUCTION AND PROGRAMS

The center will be located in Daejeon, South Korea. Preliminary designs for the building and the test bed are complete, and construction is scheduled to start in March 2012 and be completed by the end of 2013, with training programs commencing in 2014. The total area of the center is estimated to be 39,000 square meters. It will include a five-storey building with an auditorium, emergency situation room and a lecture room.

The test bed for physical protection systems will be divided into four sectors:

Sector 1 will be used for testing and training. Testing will be conducted on existing sensors currently installed and operated at nuclear facilities in South Korea. The assessments will include performance tests, environmental analysis and other examinations to produce data to develop operations guidelines on physical protection system components and Vulnerability Assessment (VA) codes. The sensors and physical layers for protection and monitoring programs installed in this sector will also be used to train security personnel. Other hardware components will be used exclusively for training purposes.

Sector 2 will be mainly used for training, especially on entry-control systems. The entry-control system and its effectiveness is a major concern when it comes to the evaluation of the overall physical protection of a nuclear facility. It is very important for operators to ensure that the entrance of a facility is secured in an accurate and effective manner (sea-land containers/vehicle inspection pads and radiation portal monitoring systems could be installed in this sector).

Sector 3 will be a test bed for newly developed sensors or state-of-the-art technologies that could be used in a nuclear facility in the near future. This sector will allow vendors to test their products and produce performance data. These data could be shared with regulatory bodies and research organizations. The information achieved through this channel could help the Korea Institute of Nuclear Non-proliferation and Control (KINAC) draw up effective guidelines and regulations, as well as become involved in the installation of new sensors. One major limitation of the existing test bed that has been operating since 2008 on a small scale is that it is very hard to replace and relocate sensors and equipment. For this reason, several key tests could not proceed as originally planned.

Sector 4 will allow other countries to conduct tests and experiments on new sensors or state-of-the-art technologies. It will be different from other training centers by virtue of the large-scale test beds that will be built. With its specialized and comprehensive training and educational programs and its testing facility, the center will contribute to international efforts to strengthen nuclear security through both skills development and research and development activities.
Sector 4 will be used for destructive experiments and tests that need additional equipment and extraordinary safety measures. This sector will be used for tests related to penetration time and the effects of specific types of attack.

The center’s programs will provide high-quality training and education in such areas as nuclear non-proliferation, nuclear security and import and export control. They are designed to enhance a student’s knowledge and technical skills. Customized programs will be provided for trainees arriving from countries that plan to build their own nuclear power plants in the near future. The courses that the center is planning include:

- **Nuclear Non-proliferation.** This course will present trainees with information on current non-proliferation arrangements. Through exercises and demonstrations, students will be introduced to the technologies of international nuclear safeguards with the aim of giving them the knowledge, analytic tools and motivation to contribute to the non-proliferation regime. The topics that will be covered include: the legal basis for nuclear safeguards, the role of the IAEA and common and emerging techniques for safeguards. The lecturers will be professionals from such organizations as the IAEA and US national labs, as well as regulatory bodies and institutions in South Korea.

- **Nuclear Security.** The objective of this course is to provide the essential elements of a national nuclear security regime. This course will also cover the fundamentals of nuclear security necessary to understand both international requirements and the measures necessary to meet any obligations under the international nuclear legal framework. Participants will examine various subjects ranging from the international regime of nuclear security to techniques related to detection, delay and response. In-depth courses on physical protection systems will also be provided.

- **Import and Export Control.** According to the guidelines of the Nuclear Suppliers Group (NSG), all items related to nuclear technology should be reviewed and approved by the government if to be exported. Those involved in the export and import of sensitive nuclear technology and materials should be familiar with the legal implementation procedures. The participants will be provided with practical knowledge and skills that can be applied to their work. This will include those who work in the public sector, such as customs officials and regulators, as well as those in private business.

**DIFFERENTIATION FROM OTHER CENTERS**

At the Washington Nuclear Security Summit, seven countries, in addition to South Korea, pledged to establish training or support centers for nuclear security. Collaboration and co-ordination among these centers will be needed to enhance the effectiveness of the programs that they will provide. To this end, the IAEA in February 2012 established the Network for Nuclear Security Training and Support Centers to facilitate co-operation. INSA has several features that set it apart from the other training centers because it will include not just course work but also R&D. The center can provide participants with in-depth practical knowledge, rather than just classroom lectures. In addition, we are preparing many customized training programs that will cover related areas like nuclear policy and technology. Compared with other centers that provide programs only for nuclear security or non-proliferation, the INSA will establish courses related to import and export control, which is essential for those who work in business sectors related to the nuclear industry. One of the most distinctive features of the center is the large-scale test bed that will be used both for training and R&D activities. Acquiring data to evaluate the vulnerability of a nuclear facility is another important function of this facility. The test bed can also be used as a place where the performance of new equipment can be evaluated. In addition, it can be used for a small-scale force-on-force exercise, a performance test of the physical protection system that uses designated trained personnel in the role of adversary forces to simulate an attack consistent with the threat. The INSA also has a long-term plan to provide education programs to enable participants to obtain an academic degree in collaboration with universities.

**CONCLUDING REMARKS**

The Washington Nuclear Security Summit helped to raise public recognition of the importance of nuclear security. In the work plan released after the summit, enhancing the world’s nuclear security culture was seen as one of the key fundamentals for improving safety and security in the nuclear industry. To achieve this, training and education programs need to be provided. From that point of view, the INSA would be an excellent tool for making critical improvements to the existing security culture at nuclear power plants and facilities.

South Korea has provided high quality programs in other fields, but currently lacks programs specifically geared to non-proliferation and nuclear security. It is expected that the INSA will play a central role in training and education for non-proliferation and nuclear security in the Asia-Pacific region. It will also support emerging countries that have plans to develop their own nuclear industry by providing customized programs, as well as technical and scientific assistance. These activities will enable South Korea to take the lead in non-proliferation and nuclear security.

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