An Analysis of International Training Courses on Nuclear Security in Korea

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1. Introduction

In 2012 at the Seoul Nuclear Security Summit, the Korean government pledged to open an international training center on nuclear security. In 2014, under the Nuclear Safety and Security Commissions' (NSSC) direction, the International Nuclear Non-proliferation and Security Academy (INSA) opened in the Korea Institute of Nuclear Nonproliferation and Control (KINAC). KINAC/INSA offers three kinds of training courses; nuclear security, safeguards, and strategic trade controls. There are two training course offerings, one in cooperation with the IAEA, and the other through KINAC/INSA only.

This paper focuses on the international training courses (ITC) of nuclear security offered by KINAC/INSA since 2014 provided to nuclear newcomer countries or countries desiring to develop a nuclear industry. KINAC/INSA continuously seeks to develop their curriculum and training effectiveness of the ITC. Thus, this research was conducted to improve the overall performance of the ITC from the results. Three recommendations are provided.

2. An Analysis of the ITC on Nuclear Security Results

This paper analyses 126 questionnaire out of a total of 133 trainees in 6 training courses over a period of five years. Seven questionnaires were too incomplete to be evaluated properly for this study.

Table I: The ITC on Nuclear Security Conducted by the KINAC/INSA

Theme	Year	Period	Trainees	Country
Nuclear Security Infrastructure Development (Introductory)	2014	5days	30	12
	2016		25	11
	2018		18	8
Physical Protection System Elements (Specialized)	2015	5days	27	11
Security Contingency Plan(Specialized)	2017	5days	18	9
Fundamentals of Cybersecurity at Nuclear Facilities (Specialized)	2017	5days	15	8

The results are structured into five sections: 1) Profile of Trainees, 2) Participating Countries, 3) Most Useful Modules, 4) Satisfaction and 5) Suggestion from Trainees.

2.1 Profile of Trainees

Participants are selected from three different organization types: government, public, and private. Most all participants are either government or public officials. The courses have been open to a maximum of twenty six participants. The selection of candidates is based on the ROK's view that their participation will lead to the strengthening of nuclear nonproliferation and security worldwide.

The participants were asked their knowledge level of nuclear security. Only 15 percent had a working level background, while almost 85 percent had little knowledge or were somewhat familiar with nuclear security.

Table II: The Trainee's Knowledge Level of Nuclear Security

Little knowledge	Familiarity	Working level	Expert
50%	34.3%	15.2%	none

2.2 Participating Countries

The following table shows the origins of participants attending the ITC on nuclear security from 2014-2018.

Table III: The Participating Countries of the ITC on Nuclear Security (2014-2018)

Continent (Ratio)	Country	Number of Attendee	Continent (Ratio)	Country	Number of Attendee
Asia (68.4%)	Philippines	17	Middle East (14.3%)	Jordan	10
	Malaysia	15		UAE	5
	Thailand	13		Saudi Arabia	4
	Vietnam	13	Eastern Europe (9.8%)	Ukraine	6
	Indonesia	10		Czech	4
	Mongolia	8		Slovakia	3
	Myanmar	6	Africa (7.5%)	Egypt	6
	Bangladesh	5		Algeria	3
	Taiwan	3		South Africa	1
	Japan	1			

Asian countries show high interest in participating in the ITC program in Korea. This ITC program has been especially attractive to nuclear newcomer Southeast Asian countries which are in close proximity to Korea. Participants are attracted to the Korea history and experience of nuclear security.

2.3 Most Useful Modules

The content of this training program usually consists of between 15 and 20 modules, including hands-on exercises.

Results show that participants are most interested in experiential exercises and facility tours – those that offer knowledge through hands-on experience.

Table IV: Most Useful Modules of the ITC on Nuclear Security

Theme	Most Useful Modules
Nuclear Security Infrastructure Development (Introductory)	- Physical Protection Concepts - Physical Protection System - System Effectiveness Evaluation (including hands-on exercise)
Physical Protection System Elements (Specialized)	- Introduction to the Design of Physical Protection Systems - Contraband Detection - Entry Control (including hands-on exercise)
Security Contingency Plan (Specialized)	- Nuclear Security and Contingency Plans - Facility and Target Characterization - Scenario Analysis
Fundamentals of Cybersecurity at Nuclear Facilities (Specialized)	- Cybersecurity Concepts (including hands-on exercise) - Cybersecurity Plans - Vulnerabilities and Exploitations

2.4 Satisfaction

■ *Instructor Satisfaction*

The lectures consist of Korean and foreign instructors. There were usually 5 Korean and 2 instructors from the USA in each program.

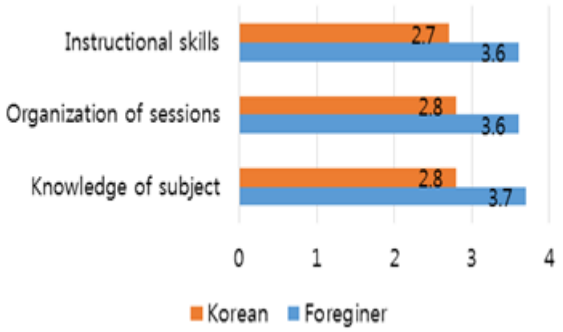

Fig. I: Instructor Satisfaction of ITC on Nuclear Security

Results showed a higher satisfaction with the USA instructors. This result can be two-fold. The foreign instructors have full-field experience in nuclear security with a long history. Compared to the USA, South Korea has relatively little history of nuclear security, but Korean lecturers are gaining the training skills and expertise. However, the results averages can be affected by the higher number of Korean instructors.

■ *Overall Satisfaction*

Overall satisfaction is 91.5% (indicated average given 85%) with the ITC on nuclear security. Each ITC has had different feedback and requests from the participants (See 2.5). KINAC/INSA has been operating fully to meet the participant's expectations. Satisfaction results have been steady operating mainly above 90%.

Table V: Overall Satisfaction of the ITC on Nuclear Security

Year	Theme	Overall Satisfaction
2014	Nuclear Security Infrastructure Development (Introductory)	91.0%
2015	Physical Protection System Elements (Specialized)	91.5%
2016	Nuclear Security Infrastructure Development (Introductory)	89.5%
2017	Security Contingency Plan (Specialized)	93.6%
	Fundamentals of Cybersecurity at Nuclear Facilities (Specialized)	90.9%
2018	Nuclear Security Infrastructure Development (Introductory)	92.5%
Average		91.5%

2.5 Suggestions from Trainees

Most of the participants have come from newcomer countries and have been requesting hands-on exercises of the most effective modules. Participants find the courses dealing with the basic concepts of nuclear security, policy, and system design which is most helpful during the development of the initial stages of a nuclear power plant in their home countries.

This table summarizes the main additional requests written by participants.

Table VI: Summary of the Main Additional Requests

Category	Additional Requests
Curriculum	- Offer more hands-on exercises - Visit a nuclear facility
Organization	- Extended training period
Korean Culture	- Desire more extracurricular experiences

Table VII is a sample of feedback from a participant of the ITC on nuclear security (theme: Nuclear Security Infrastructure Development), March 10-14, 2014.

Table VII: Trainee's Comment from Newcomer Country

Our country is now in the early stage of building a power plant. So security is what we are looking for to learn and gain experiences from the world. The course will help us a lot in assisting our plan to become successful. Not only in every elements of the PPS but also for our regime. The exercise gave us the chance to share. Our experiences solve on on-going problems getting in touch with current technology is needed for PPS.

3. Conclusions

Based on the results of the survey, there are three recommendations: First, continue the enhancement of Korean nuclear security instructors through research and additional education training; Second, offer additional hands-on training experiences with extended time for practice; and Third, improve the overall satisfaction of attendees by closely monitoring participant's feedback and global nuclear security trends.

The grouping of global nuclear security training participants can also have a positive effect after the training session. Participants share and provide personal information and contact during the training program and thus continue contact and the sharing of nuclear security trends and information after their training.

Future research can focus on: One, the effectiveness of the ITC on nuclear security after the participants return to their workplace and Two, the post nuclear security training merits of nuclear personal expanding their global network and sharing of information.

Through continued research, KINAC/INSA will improve this training course for its development and continuous sustainability. Through the enhancement and improvement of ITC on nuclear security, KINAC/INSA will greatly contribute to promoting and strengthening the international nuclear nonproliferation and security regime.

REFERENCES

[1] Annual Report 2014~2017, KINAC/INSA
[2] Survey results of International Training Course on Nuclear Security 2014~2018.