

## Development of Nuclear Forensics Training Course for ASEAN Member States

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### 1. Introduction

During the 2014 Nuclear Security Summit, nuclear forensics was identified as the key element to nuclear security. 30 countries including the Republic of Korea (ROK) committed to enhancing national and international nuclear forensics capabilities through cross-disciplinary training [1].

Nuclear terrorism is one of the most challenging threat all over the world. According to the International Atomic Energy Agency (IAEA) Incident and Trafficking Database (ITDB), 3497 incidents were reported by participating States until 2018 [2]. Nuclear forensics is an investigation and examination of nuclear materials out of the regulatory control in the context of legal proceedings under international or national law related to nuclear security. In this point of view, nuclear forensics has strong deterrence effect against the illicit trafficking.

Demands for building nuclear forensics capabilities within the ASEAN (Association for Southeast Asian Nations) are increasing as the states continue to strive to respond to illicit trafficking in nuclear and other radioactive materials. At 2019 ASEANTOM, the ROK was requested to hold nuclear forensics training course for ASEAN member states to enhance their nuclear forensics capabilities. Therefore, the ROK has planned to develop the nuclear forensics training course for the ASEAN member states with the IAEA.

As the first step for developing training course, a workshop was held to discuss and set priorities among the various nuclear forensics areas (see Table 1) and determine appropriate training methods prior to organizing the training course. Through this workshop, we identified that more systematic approach such as a questionnaire would be necessary for detailed analysis on the current status and needs.

Thus, the IAEA nuclear forensics questionnaire was developed and circulated to ASEAN member states for systematic approach for conducting a follow-up action of the workshop. The questionnaire results will then contribute to the construction of the nuclear forensics training course.

### 2. Nuclear Security of ASEAN member states

ASEAN member states have been making gradual progress in their economic growth. They have had an interest in nuclear energy to reduce dependency on the oil industry. For example, Vietnam planned to build nuclear generation with the capacity of 6 GW by 2025 [3] and Thailand had a plan to bring 5 nuclear power plants by 2030 [4]. However, the Fukushima accident in 2011

has significantly influenced a plan for the nuclear power plant construction due to the negative public opinion towards nuclear safety. Therefore, the plans for nuclear energy have been cancelled or postponed indefinitely.

Even though there is no nuclear energy in ASEAN member states in current, demands for nuclear and radioactive materials have continuously increased in various industries including medical, agriculture, and energy field. However, the geographical circumstance of ASEAN member states, being long coastlines with many islands, brings cross-border challenges to nuclear security: terrorism, insufficient border control, and lack of human resource to build capabilities [5].

Nuclear forensics has been increasingly becoming an important tool against these challenges, especially against an illicit trafficking of nuclear and radiological materials. As nuclear forensics is identified as one of the key areas of regional nuclear security, ASEAN member states have tried to build their own capacity to face the regional threat for eliminating the weak links.

Table 1. Nuclear forensics areas

No	Nuclear Forensics Area
1	Crime Scene Management
2	Legal Framework & Law Enforcement
3	Material Sampling & Transportation
4	Analysis & Interpretation
5	National Nuclear Forensics Library
6	International Cooperation

### 3. Workshop for the development of Nuclear Forensics Training Course for ASEAN member states

Under the request at 2019 ASEANTOM, the ROK has propelled to develop the training course for ASEAN member states. Identification of existing capabilities and needs is crucial for developing a training course to reflect the region's diverse security requirements.

For the implementation of developing the training course, the Ministry of Foreign Affairs (MOFA) of ROK is propelling this under the cooperation of the Korea Institute of Nuclear Nonproliferation and Control (KINAC)/International Nuclear Nonproliferation and Security Academy (INSA) and the IAEA. Also, through the support of the US Department of Energy/National Nuclear Security Administration (DOE/NNSA) and the

European Commission-Joint Research Centre (EC-JRC), it expects to construct a more systematic educational program.

Experts from the IAEA, DOE/NNSA and the EC-JRC, together with regulators, experts and diplomats representing seven ASEAN member states, and the ROK gathered to discuss a prerequisite to developing the nuclear forensics training course.

The contents of the workshop included definition, characteristics of nuclear forensics, training courses of the IAEA, US, EC-JRC, and discussion about their requirements for further training course. Specially, we focused on sharing experience session because we could find out which area would be necessary for ASEAN member states through this session.

Table 2. Contents of the workshop

No	Contents
1	Background and Objective of the Workshop
2	Nuclear Forensics to Prevent and Respond to Nuclear Security
3	Sharing Experience: State's Implementation of Nuclear Forensics
4	Requirements for Nuclear Forensics Training in ASEAN
5	Introduction to Training Matrix and Nuclear Forensics Trainings of the IAEA, DOE/NNSA, the EC-JRC
6	Nuclear Forensics Training Strategy for ASEAN

### 3.1 Findings of the workshop

Sharing the experience of implementation at the workshop has played a crucial role in investigating the current nuclear forensic status of each state. There is a gap among the states' levels of nuclear forensics capabilities, and some states have been supported to build their own national capability by other country or organization.

Furthermore, many nuclear forensics training courses have been already developed and operated by the three major providers, IAEA, DOE/NNSA and EC-JRC. The existing training courses might be modified to meet the specific requirements of ASEAN member states.

These findings manifested that a new tool which can clarify the capabilities and needs of nuclear forensics for each ASEAN region is required. Thus, all participants agreed to utilize the modified IAEA questionnaire to determine the specific nuclear forensics training areas. The IAEA introduced its nuclear forensics questionnaire to frame and prioritize the types of necessary technical assistance.

### 3.2 Development of nuclear forensics questionnaire

KINAC/INSA and the IAEA modified the previous version of the questionnaire to apply it to ASEAN member states appropriately. The questionnaire was designed to identify the current capabilities and specific requirements for nuclear forensics in ASEAN region. The structure and contents are primarily based on the Nuclear Forensics Model Action Plan in the IAEA Security Series No. 2-G (Rev.1).

The results of the questionnaire will become a good starting point for a further discussion and development of the nuclear forensics training course for ASEAN member states.

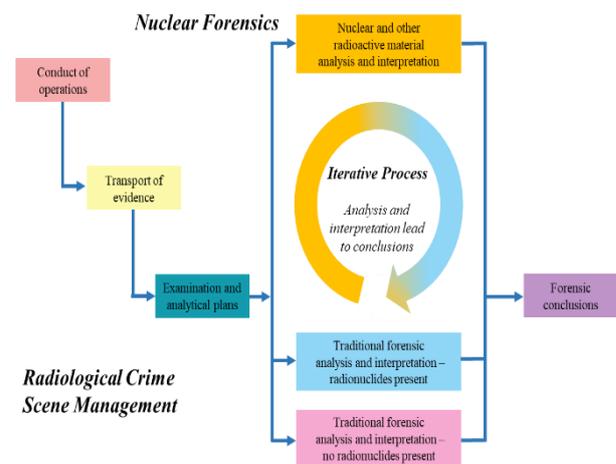


Figure 1. Diagram of the nuclear forensics model action plan in the IAEA NSS. 12-G

## 4. Conclusions

Nuclear forensics is one of nuclear security infrastructures that should be organized and enhanced to respond to nuclear security events. Furthermore, the gift basket about the forensics in nuclear security was presented at the 2014 nuclear security summit and the ROK committed to the statement of: good practices employed by practitioners, developed education and training curricula, and international collaboration. In this respect, the development of nuclear forensics training course for ASEAN member states will contribute to the implementation of commitment to the international community.

Through the workshop for developing the nuclear forensics training course for ASEAN member states, we identified that it is essential to understand the regional status and requirements prior to establishing the training curriculum including the training level, lecture type, and main contents. The results gained from the questionnaire is anticipated to significantly contribute to reflecting the needs of the regions for organizing and developing the training course.

## REFERENCES

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