

**Current Activities and Future Challenges of Nuclear Security and Safeguards Project in
Forum for Nuclear Cooperation in Asia (FNCA)
and ISCN engagement**

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Abstract

In response for climate change and the diversification of energy resources, several Asian countries have currently considered nuclear power as an option. As a result, a dramatic increase on the use of nuclear material is foreseen; nuclear security and safeguards, as well as nuclear safety, will become more important in the promotion of the peaceful uses of nuclear energy. For this background, the Nuclear Security and Safeguards Project (NSSP) started in 2011 within the framework of FNCAⁱ, aims to cooperate with FNCA member countries to strengthen their respective regimes. FNCA is a framework led by Japan's Cabinet Office and the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) since 2000 for international cooperation with neighboring Asian countries towards the peaceful uses of nuclear technology. Currently, 7 topical projects including NSSP are being conducted with collaborative activities under equal partnership in various nuclear fields. Each project promotes joint research, discussions on common challenges, and information exchange. A workshop is held annually. The objectives of the NSSP are to share experiences, knowledge, and information on nuclear security and safeguards implementation including human resource development (HRD) and research and development activities. From 2020, new activities started in the NSSP. As one of the new activities, a nuclear security stake holder matrix project has been started. This activity identifies the categories of jobs that ensure nuclear security in each country, identifies the capacities required for the job, and identifies the presence or absence of gaps. FNCA Member states will utilize the outcome of this project for human resource development programs and improvements for its regime. We plan to hold training courses and workshops while identifying gap over the next three years. The Integrated Support Center for the Nuclear Nonproliferation and Nuclear Security (ISCN)ⁱⁱ of the Japan Atomic Energy Agency (JAEA) has been established according to the Japan's commitment at the first nuclear security summit in Washington D.C. April in 2010. ISCN has been providing capacity building support activities such as training courses on nuclear security and safeguards especially to Asian countries. Therefore, ISCN has closely collaborated with the NSSP. In this article, I will illustrate the results of FNCA's activities and future plan as well as ISCN engagements to the NSSP.

1. INTRODUCTION

1.1 What is FNCA

FNCA is a Japan-led cooperation framework for the peaceful use of nuclear technology in Asia. At present, FNCA's 7 projects are being conducted in various nuclear energy fields. Each project promotes information exchanges, joint research, and debates on common challenges, and holds a workshop annually, including open seminars. Each project also reports information exchanges and research results and provides guidelines/manuals on which activities in Asian countries should be based. Under this framework, the 7 projects are as follows: 1) Mutation Breeding, 2) Radiation Processing and Polymer Modification, 3) Research on Climate Change using Nuclear and Isotopic Techniques, 4) Radiation Oncology, 5) Research Reactor Utilization, 6) Radiation Safety and Radioactive Waste Management, and 7) Nuclear Security and Safeguards.

1.2 Framework of FNCA

The basic framework of cooperation, as shown in Figure 1, consists of the following three systems and project activities:

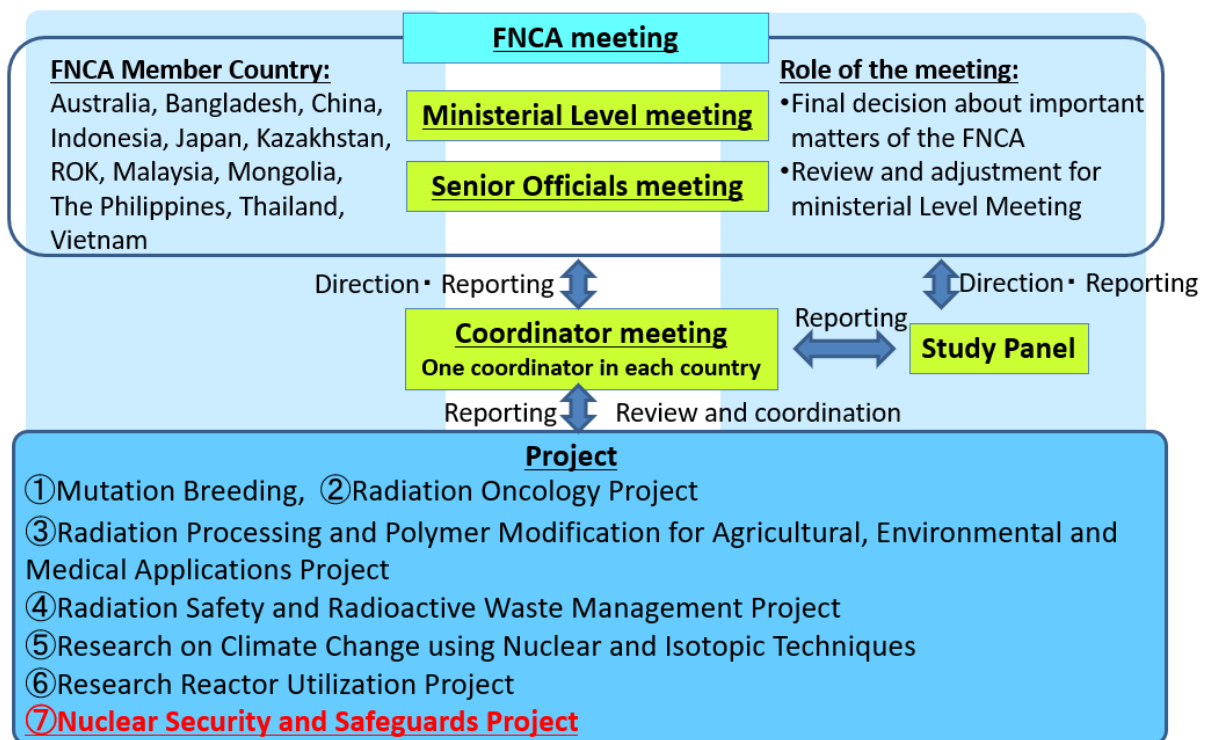


Figure 1 FNCA Framework

(1) FNCA Ministerial Level Meeting (MLM)

FNCA meeting is composed of MLM and Senior Officials meeting in which cooperation measures and nuclear energy policies are discussed. MLM is a gathering of ministerial level representatives in science and technology who are in charge of activities that use nuclear energy and radiation. FNCA's cooperation policies and participating countries' nuclear energy policies are discussed. At

the Senior Officials meeting, the representatives from each participating country gather to hold a preliminary discussion on the preparation, theme, and specific topics for MLM.

(2) Coordinators Meeting

The total review and coordination of FNCA projects are implemented by an appointed coordinator from each member country. A coordinator is appointed for each participating country with the responsibility to oversee project activities in various nuclear fields. Coordinators gather to assess the progress of individual projects and to discuss their results, evaluations, and future policies at the coordinator meeting.

(3) Study Panel

The Study Panel holds a discussion on nuclear policy matters of both power and non-power areas of nuclear energy in the participating countries, supplemented by a technical discussion on nuclear development.

2. ESTABLISHMENT AND ACTIVITIES OF NUCLEAR SECURITY AND SAFEGUARDS PROJECT

2.1 Establishment

NSSP was established in Japan's Fiscal Year (JFY) 2011ⁱⁱⁱ, addressing the Resolutions of the 11th (2010) & the 12th (2011) FNCA MLMs respectively. The project is aimed at sharing experience in, knowledge of, and information on nuclear security and safeguards implementation, and exchanging views on policies, strategies, and frameworks for better performances in these areas. Alongside this background, the project is expected to:

- Raise awareness of the importance of nuclear security and safeguards,
- Facilitate information sharing in these areas,
- Promote capacity building efforts in these areas, and
- Enhance the regimes of nuclear security and safeguards by sharing information on technical tools and requirements of nuclear security and safeguards.

FNCA member countries have been improving knowledge and awareness of the importance of nuclear security and safeguards through information exchange on the implementation of nuclear security and safeguards in each country in combination with workshops (WSs) and open seminars.

2.2 Activities

A two days or three days workshop is held at member states once a year to share information such as good practices of member countries in ensuring nuclear security and implementing safeguards. Table 1 shows the results of the workshops and open seminars that have been held over the past 10 years^{iv}. Recently to build the capabilities in this field, we also carry out table-top exercises during the workshops. In response to the needs of the country hosting the workshop, we have recruited a

wider range of participants at the margin of the workshop, set topics for nuclear non-proliferation and nuclear security, and to hold open seminars, occasionally. We also conduct information exchange through e-mail and FNCA websites daily-bases. Since its establishment in 2011, NSSP has made an activity plan with three years as one phase and has been active in the first phase (2011-2013), the second phase (2014-2016), and the third phase (2017-2019)^v. Currently, it is in the activity period of the 4th phase. The activities in 2020 could hardly be done due to the COVID-19 pandemic worldwide. The fourth phase is four years from 2020 to 2023.

Table 1 Results of the NSSP workshops to be held over the past 10 years

Year (JFY)	FNCA NSSP Workshop at	Open Seminars (No. of Participants)
2011	Tokai-mura, Japan	
2012	Hanoi, Vietnam	On AP (29)
2013	Beijing, China	
2014	Daejeon, ROK	
2015	Semey, Kazakhstan	On 5 th Anniversary of NSSP (34)
2016	Jogjakarta, Indonesia	On Nuclear Security HRD (42)
2017	Tokai-mura, Japan	
2018	Beijing, China	
2019	Manilla, Philippines	
2020	Web Online (Zoom)	

3. ACCOMPLISHMENTS FOR TEN YEARS' ACTIVITIES

3.1 Outcomes for information sharing

To enhance the communication for information sharing among the member states we composed the table of list for domestic authorized agency for 3S, who is the point of contact for safety, safeguards, nuclear security. We could contact and communicate to the POCs for teaching each other on daily bases.

We have compiled a list of how the member states are doing to foster a nuclear security culture, table of the information on nuclear security culture development.

In the safeguards area, we have made a report on good practices among the member states on the implementation on the Additional Protocol to the IAEA safeguards agreement. Now we plan to this document to be an IAEA's document, information circular of IAEA. We would like to share our member states experiences to IAEA's member states as well, more widely.

3.2 Capacity building

To build the capabilities for nuclear forensics, we also carry out table-top exercises during the workshops. In 2019 workshop in Manila, we conducted a tabletop exercise using actual radioisotopes to learn the initial response when non-regulated radioisotopes are detected at national borders. Participants learned what kind of organizations need to contact and cooperate when a nuclear security incident occurs at the border, and what kind of preparations must be made on a regular basis for that purpose.

As for safeguards, a virtual exercise on Complimentary Access (CA) for IAEA Safeguards was implemented at the online workshop in 2020(JFY). CA will be carried out by IAEA inspectors pursuant to the additional protocol (AP). Beginning with advanced notice from the IAEA for CA implementation. Inspectors arrive at the site then they have a prior meeting with facility's operators followed by on-site activities such as visual observations, taking photographs, dose measurements, environmental sampling, and so on. We realized those exercise with virtual format under COVID-19 pandemic. We learned objective and activities of a CA and got familiar with the procedures through the exercise.

We also conduct the various needs survey for capacity building. Then we offered training courses based on the results of the needs survey as an ISCN activities.



Photo 1 Table top exercise on nuclear forensics at the workshop in Manila, 2019

4. THREE-YEAR PLAN FROM 2021 to 2023

4.1 Nuclear security

First activity is to learn good practices of regional collaboration on the implementation of nuclear forensics. This will lead to the establishment of a cooperative system for nuclear forensics in the region so that when an actual nuclear security event occurs, it can be dealt with promptly and steadily.

Second, we plan to make a nuclear security stakeholder matrix. A state's nuclear security regimes consist of various components: national strategy, law, threat assessment, regulators, license holder and so on. There are wide areas of activity and stakeholders in nuclear security, such as intelligence, regulatory authorities, license holders, law enforcement, military, frontline officers, first responders.

Objectives of making the nuclear security stakeholder matrix is to get a full picture of nuclear security activities of a state. Firstly, each member states will list up the roles, activities, and capacity for them. Through those activities we could identify gaps in infrastructure development for a state's nuclear security regime and identify gaps in capacity building on nuclear security. Then we will fill the gap to be commenced training courses. Those are the objectives of nuclear security stakeholder matrix.

We will continue gathering good practices on fostering nuclear security culture as well.

4.2 Safeguards

As for Safeguards, aiming to utilize our report on good practices related to the implementation of the additional protocol as an IAEA document. Developing and conducting exercise on the export control required by the IAEA Additional Protocol Annex II.

5. ENGAGEMENT OF ISCN TO THE FNCA NSSP AND ITS OUTCOMES

ISCN of JAEA has been established according to the Japan's commitment at the first nuclear security summit in Washington D.C. April in 2010. ISCN has been providing capacity building support activities such as training courses on nuclear security and safeguards especially to Asian countries^{vi}. NSSP was established a year after ISCN was founded. ISCN has been deeply involved in this project since the establishment of NSSP, as both had the same purpose of strengthening nuclear non-proliferation and nuclear security in the Asian region. As of July 2021, there are 4,989 participants in 197 courses (101 countries, 6 international organizations) to be joined ISCN organized training course since its establishment as shown in Figure 2. Total participant from FNCA member countries is 1682. This is equivalent to 56 % of foreigners joining ISCN training courses.

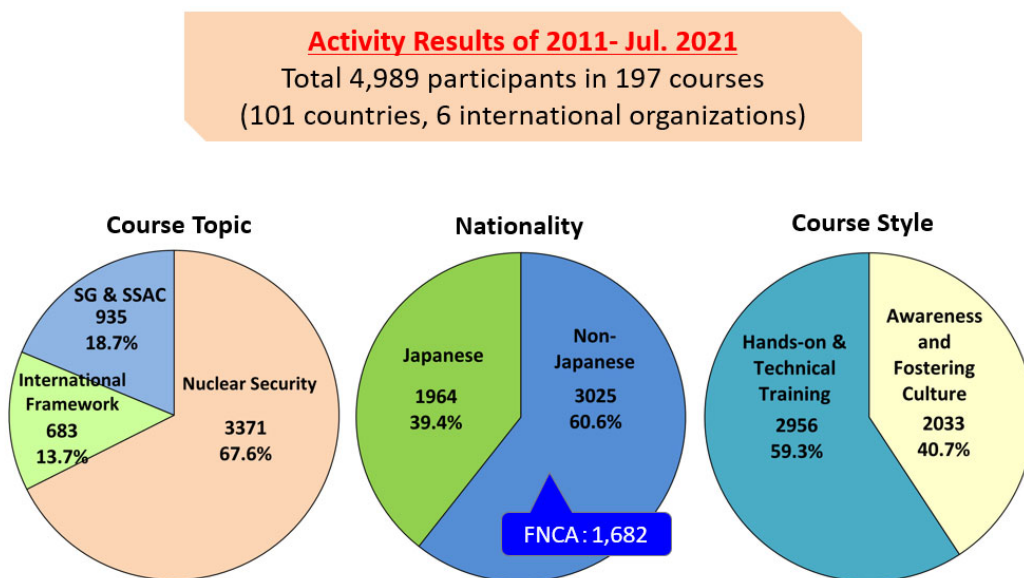


Figure 2 Tracking record of ISCN capacity building support activities

Through NSSP's activities, ISCN could obtain valuable information on what kind of challenges FNCA member countries have in relation to nuclear security regimes and safeguards implementation and what kind of human resource development needs they have. For example, at the workshop held in 2017, we shared information on present status to nuclear forensics in each member states and discussed the needs of capacity building in member countries related to nuclear forensics. After the workshop, ISCN started to develop for nuclear forensic basic training course in collaboration with the office of atoms for peace in Thailand based on the results of information and the discussion. And in 2018, with the cooperation of Thailand, we were able to hold a nuclear forensics training at ISCN. Furthermore, following the basic course, it was planned to hold an advanced course in 2020 in cooperation with Japan and Thailand, but unfortunately it was postponed due to the outbreak of the corona pandemic today. This training course is scheduled to be held in 2022. This is one of the best examples of ISCN's engagement with FNCA. We are constantly sharing information on ISCN's training holding plans with FNCA member countries, and are cooperating with each other to strengthen nuclear non-proliferation and nuclear security.

6 CONCLUSIONS

Established in 2011, FNCA NSSP has been working for 10 years to strengthen nuclear non-proliferation and nuclear security. NSSP has achieved various outcomes in information sharing and lesson learned each other, including the good practices report on the implementation of the IAEA's additional protocol and sharing good practices on fostering nuclear security culture within the FNCA member states. NSSP has also accomplished results with regard to capacity building by introducing table top exercise (TTX) at the workshops.

ISCN of JAEA has been established according to the Japan's commitment at the first nuclear security summit in Washington D.C. in 2010. ISCN has been providing capacity building support activities such as training courses on nuclear security and safeguards especially to Asian countries. Through NSSP activities, ISCN has obtained valuable information such as challenges faced by member countries and human resource development needs. ISCN has reflected those in its activities. ISCN has supported NSSP's activities regarding human resource development activities.

The fourth phase from 2021 to 2023 of NSSP has just began. The nuclear security stake holder matrix project, establishing regional collaborating system on nuclear forensics, developing and conducting exercise on the export control required by the IAEA Additional Protocol Annex II and so on have been started. NSSP, in cooperation with ISCN, would like to continue to contribute to strengthening nuclear non-proliferation and nuclear security in the Asian region.

ⁱ <https://www.fnca.mext.go.jp/english/>

ⁱⁱ https://www.jaea.go.jp/04/iscn/index_en.html

ⁱⁱⁱ https://www.fnca.mext.go.jp/english/nss/e_introduction.html

^{iv} https://www.fnca.mext.go.jp/english/nss/e_ws.html

^v Masao Senzaki, et, al., “Activities and Challenges of Nuclear Security within the Forum for Nuclear Cooperation in Asia” , Proceedings of IAEA International Conference on Nuclear Security (ICONS) 2020, Vienna, February 2020

^{vi} Yosuke Naoi, Masato Hori, Naoko Noro, JAEA, “ Good practices on HRD support activities of ISCN”, Proceedings of INMM 61st Annual Meeting, 2020