

Development of Technology and Human-Capacity Building in the Nuclear-Nonproliferation and Nuclear-Security Fields to Support the Peaceful Use of Nuclear Energy

The Integrated Support Center for Nuclear Nonproliferation and Nuclear Security (ISCN) has been conducting the following activities on technology and human-resources development related to nuclear nonproliferation and security, cooperating with affiliated domestic and overseas institutions toward a world without treats of nuclear weapons and nuclear terrorism (Fig.10-1).

Technology Development for Japanese and International Applications

We have been developing technologies to strengthen nuclear nonproliferation and security in accordance with domestic and international trends. We are addressing the development of new technologies that enable the nuclear material measurement although it is difficult to measure nuclear material by conventional means. Examples of our projects include non-destructive assay technology (NDA) to quantify the nuclear materials in fuel debris at the TEPCO's Fukushima Daiichi NPS, nuclear material detection and measurement technologies, for uses such as detecting nuclear materials in heavily shielded containers using nuclear-resonance fluorescence analysis and NDA to measure nuclear material with fission products through irradiation with an external pulsed neutron source. Recently, we have begun developing evaluation metrics for the attractiveness of nuclear or radioactive material for nuclear security in collaboration with the US. Furthermore, we have been improving the accuracy and expediting the analysis of nuclear forensics technologies which can identify the origin and processing history of nuclear materials used in criminal acts. We have also commenced development of nuclear forensics technology for use following a nuclear-terrorism event. Topic 10-1 outlines a study on a new uranium-age-dating technique, which is one of the most important elements of nuclear forensics to be developed by JAEA/ISCN.

Support Government Policymaking Based on Our Technological Expertise

We conducted policy research on the synergistic effects of nuclear-nonproliferation safeguards and nuclear security (collectively called the 2Ss) measures in nuclear-fuel-cycle facilities. To enhance and promote both 2Ss, we first clarified not only specific measurement and surveillance technologies, equipment, tools, and information but also declared possible fuel-cycle facilities and their processes to enable the maximization of 2S's synergistic effects. Then, challenges

and possible solutions for the feasibility and applicability of future nuclear-fuel-cycle facilities were analyzed and evaluated.

Support for Human-Capacity Development

Following Japan's national statement at the April 2010 Nuclear Security Summit, ISCN has conducted capacity-building support activities targeting Asian countries since 2011. As of March 2018, about 3800 individuals from Asian countries including Japan have participated in seminars and training related to nuclear nonproliferation, safeguards, and nuclear security, as organized by ISCN. ISCN's capacity-building-support activities have contributed to human-resource development in Asia in particular and have drawn high praise from the US and Japanese governments.

Contributions to the International Verification Regime for CTBT

To establish a global verification regime for nuclear testing, we have been provisionally operating the facilities of the international monitoring system of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) and a national data center. After the 6th nuclear test conducted by North Korea in September 2017, JAEA reported the results of analysis and evaluation of data observed at the CTBT radionuclide-monitoring stations to the national government in a timely manner, thereby contributing to evaluation by the national government based on the CTBT national-operation system of Japan.

Support for JAEA's Nuclear-Fuel Transportation and Procurement of Research Reactor Fuels

We support the nuclear transportation being performed by our research and development centers. We have coordinated the procurement of fresh fuels and the disposal of spent fuels for our research reactors. Through these activities, we contribute to the Global Threat Reduction Initiative (GTRI), which has been strengthening global nuclear security by promoting the systematic return of highly enriched uranium to the US.

Efforts to Promote Understanding

ISCN contributes to promote understanding of this field for domestic and overseas by investigating and analyzing international trends related to nuclear nonproliferation and nuclear security and by delivering the ISCN News Letter, holding an International Forum on Peaceful Use of Nuclear Energy, among other activities.

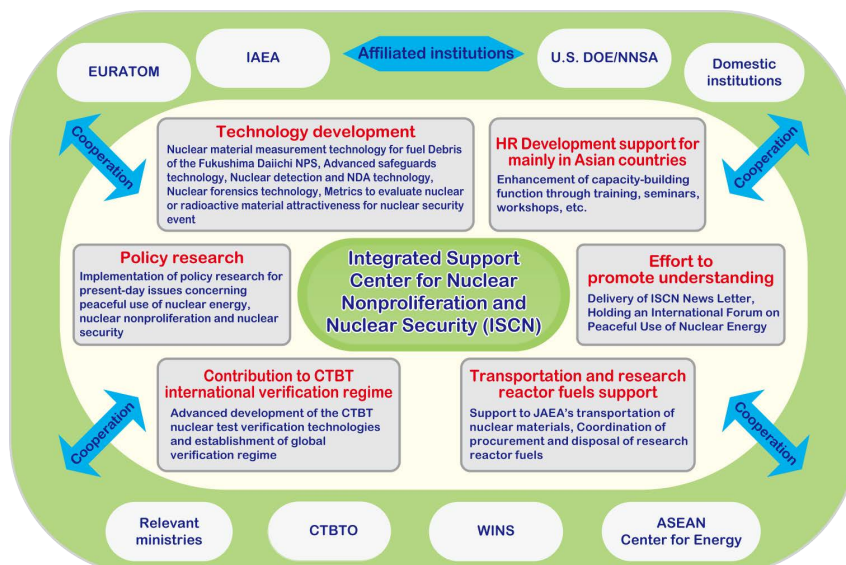


Fig.10-1 ISCN activities and affiliated institutions

We have been playing an active role in strengthening nuclear nonproliferation and nuclear security in cooperation with affiliated domestic and overseas institutions.