

## Technological Development and Human Capacity Building in the Area of Nuclear Nonproliferation and Nuclear Security to Support the Peaceful Use of Nuclear Energy

The Integrated Support Center for Nuclear Nonproliferation and Nuclear Security (ISCN) has been conducting the following technological and human capacity development activities related to nuclear nonproliferation and nuclear security in cooperation with relevant domestic and overseas organizations (Fig.11-1).

### Technological Development for Japanese and International Applications

We have been developing a nondestructive assay technology based on passive  $\gamma$ -ray emission from fission products coexisting with nuclear materials to quantify nuclear materials in fuel debris at the Fukushima Daiichi Nuclear Power Station of Tokyo Electric Power Company, Incorporated and have also been examining safeguard technologies in case spent fuel direct disposal is applied. We have developed some basic technologies for nuclear measurement and detection to enhance nuclear security and improve safeguards. Furthermore, we have developed basic analytical technologies for nuclear forensics. Topic 11-1 shows one of the results of this development, namely, a database called the nuclear forensics library.

### Support for Government Policy Formulation Based on Our Expertise

We are conducting research on measures for ensuring nuclear nonproliferation and nuclear security on the backend of the nuclear fuel cycle. To reduce the burden of safeguards upon the direct disposal of the spent fuel, the plutonium concentration and isotopic ratio in spent fuel as well as the difficulty in recovering plutonium from spent fuel were investigated.

Based on the investigation, practical measures for future institutional issues were studied.

### Support for Human Capacity Development

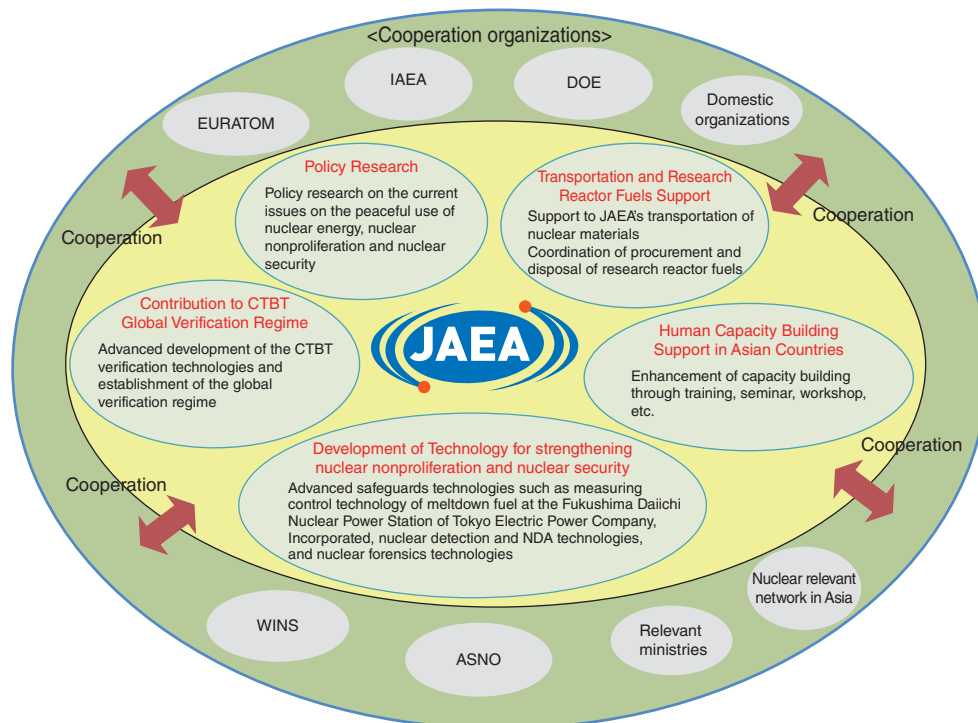
Based on the commitments of the Japanese government at the Nuclear Security Summit in April 2010, we established the center, which will contribute to strengthening nuclear security among Asian countries. In FY 2014, approximately 680 participants (approximately 410 participants from Asian states) participated in the seminars and training courses on nuclear security and safeguards.

### International Contributions Based on Our Expertise and Experience

To establish a global verification regime for the nuclear tests, we have been provisionally operating the facilities of the international monitoring system of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) as well as a National Data Center (NDC). The Takasaki Radionuclide Station not only continues to conduct particulate monitoring but also was certified by the CTBT organization as the first noble gas station in the coastal states comprising East Asia in December 2014.

### Support for JAEA's Transportation and Research Reactor Fuel Duties

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



**Fig.11-1 JAEA activities toward the development of science and technology for nuclear nonproliferation and nuclear security**

We have been playing an active role in international organizations, such as the IAEA, and in technological development in each country to ensure transparency. We are also continuing to develop human capacity to support nuclear nonproliferation and security projects in Asian countries.