

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

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

### Technology Development for Japanese and International Applications

We have been developing the nondestructive assay technology to quantify nuclear materials in fuel debris by the accident at the TEPCO's Fukushima Daiichi NPS, and also examining the safeguards\* technologies in case the spent fuel direct disposal is applied. In addition, we have been developing the nuclear detection technology by nuclear resonance fluorescence technique, the nondestructive assay technology using external pulse neutron source and the monitoring technology for plutonium solution containing fission products in order to enhance nuclear security and improve safeguards. Furthermore, we have been improving the technologies for the nuclear forensics. Topic 11-1 shows the summary of the international collaborative analysis comparison exercise for uranium age determination analysis which is one of nuclear forensics measures.

\* Verification activity to ensure that nuclear materials are limited to peaceful uses and not diverted to nuclear weapons.

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

We conduct the research on synergy effects on Non-proliferation (Safeguards) and Nuclear Security measures at nuclear fuel cycle facilities. In order to enhance and promote both Safeguards and Nuclear Security (so called "2Ss"), international trend survey on synergy effects was proceeded as basic study, eyeing possibility of utilizing originally "IS"-purposed measurement and surveillance technologies, safeguards equipment and information for "2Ss" purposes

in future nuclear fuel cycle facilities. We also examined applicability of the International Atomic Energy Agency (IAEA) recommended measure for "2Ss" to MOX fuel fabrication and fuel storage facilities.

### Support for Human Capacity Development

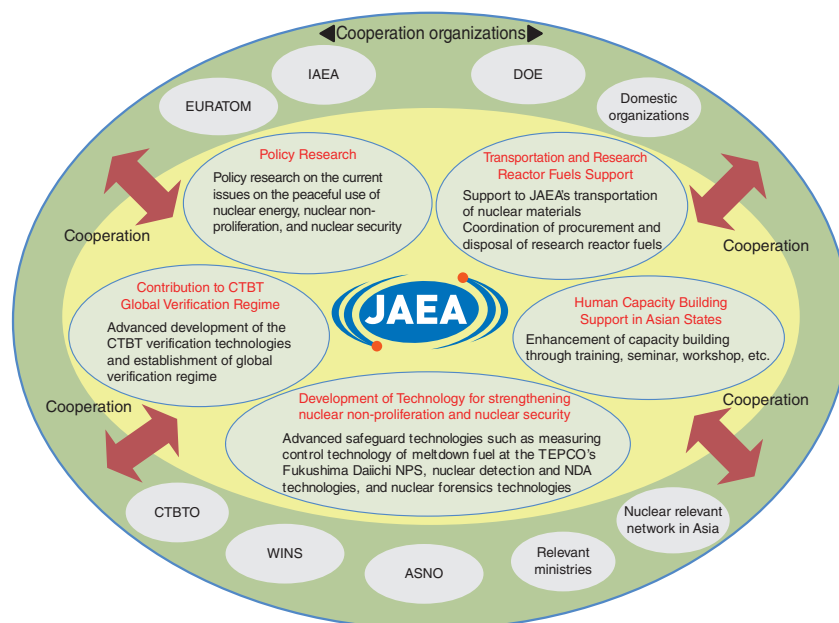
Based on the commitments of the Japanese government made at the Nuclear Security Summit in April 2010, we have supported human capacity development, especially among Asian states, since April 2011 in order to strengthen nuclear security in these countries. In FY 2015, approximately 530 (approximately 300 from Asian states) participants benefitted from our seminars and training courses on nuclear security and safeguards held within and outside of Japan.

### International Contributions Based on Our Expertise and Experience

To establish the global verification regime for nuclear tests, we have been operating provisionally facilities of the international monitoring system of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) and a national data center (NDC). For the 4th nuclear test conducted by North Korea in January 2016, JAEA reported the analysis and evaluation results of data observed at the CTBT radionuclide monitoring stations to the national government etc. in a timely manner and thereby contributed to the evaluation by the national government based on the CTBT operation system in Japan.

### Support to JAEA's Transportation and Duties of Research Reactor Fuels

We support to nuclear transportation carrying out by our research and development centers, we 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 high enriched uranium to USA.



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

We have been playing an active role in international organizations, such as IAEA, technology development in each country and ensuring transparency. And we continue human capacity development support project which contributes the capacity building in Asian countries.