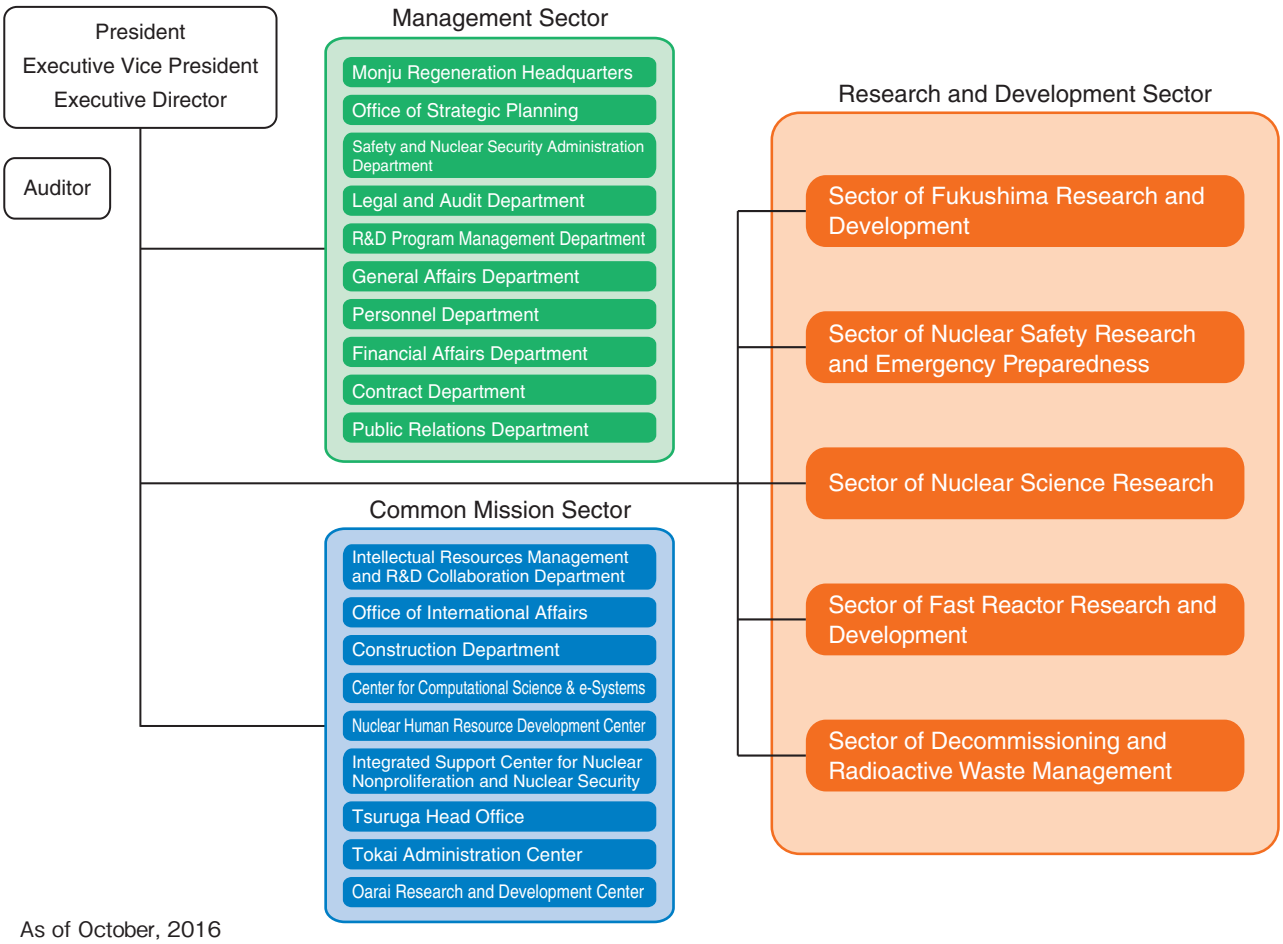
About This Publication and the Outline of the Organization of JAEA

This publication introduces our latest research and development (R&D) results in each field. Each chapter presents the activities of one R&D Sector. The various R&D Sectors perform their activities through R&D centers or institutes. Depending on the R&D activities, some of these centers or institutes comprise only one site, whereas others comprise two or more sites. The R&D centers and institutes are located throughout Japan, as shown on the map below. The following brief introduction outlines the research undertaken by each R&D Sector at various R&D centers and institutes.

1. **The Sector of Fukushima Research and Development** is engaged in R&D, aimed at recovery from the accident at the Fukushima Daiichi Nuclear Power Station of Tokyo Electric Power Company Holdings, Inc. (TEPCO). To contribute to the realization of a secure environment for residents, the Fukushima Environmental Safety Center has been conducting environmental radiation monitoring and R&D for monitoring radioactive cesium behavior in the environment and for developing decontamination and volume reduction technologies. The Collaborative Laboratories for Advanced Decommissioning Science (CLADS) has been conducting R&D ranging from basic research to applied studies, such as understanding of the properties of fuel debris, analysis of the situation inside the reactors, and processing and disposal of radioactive waste, in line with the "Mid-and-Long-Term Roadmap towards the Decommissioning of the TEPCO's Fukushima Daiichi Nuclear Power Station Units 1-4". Moreover, the Fukushima Research Infrastructural Creation Center has two indispensable bases for R&D facilities, promoting the decommissioning of the TEPCO's Fukushima Daiichi Nuclear Power Station. One of those, "Naraha Remote Technology Development Center" has started operations. Another one, "Okuma Analysis and Research Center" has been preparing for start.
2. **The Nuclear Safety Research Center, Sector of Nuclear Safety Research and Emergency Preparedness,** is in charge of safety research that supports the national nuclear safety bodies that regulate nuclear power plants, nuclear fuel cycle facilities, and radioactive waste-disposal facilities. This work is being conducted at the Nuclear Science Research Institute.
3. **The Advanced Science Research Center, Sector of Nuclear Science Research,** explores yet-undiscovered disciplines and studies advanced atomic energy sciences via the Nuclear Science Research Institute to develop new theories and investigate novel phenomena, materials, and technologies. In particular, six research themes have been organized under the two divisions "advanced actinides science" and "advanced nuclear materials science".
4. **The Nuclear Science and Engineering Center, Sector of Nuclear Science Research,** is engaged in key and basic research on various fundamental technologies that support nuclear power use. These efforts are being conducted mainly at the Nuclear Science Research Institute and the Oarai Research and Development Center.
5. **The Quantum Beam Science Center, Sector of Nuclear Science Research,** is engaged in research using neutrons at the Nuclear Science Research Institute and Japan Proton Accelerator Research Complex (J-PARC). Work using electron beams, gamma rays, and ion beams is being conducted at the Takasaki Advanced Radiation Research Institute. Research using lasers and synchrotron radiation is being performed at the Kansai Photon Science Institute. A part of quantum beam science research was taken over to the National Institutes for Quantum and Radiological Science and Technology (QST) established in April 2016, and the Quantum Beam Science Center was reorganized into the Materials Sciences Research Center.

Japan Atomic Energy Agency -Outline of Organization-



As of October, 2016

6. **The HTGR Hydrogen and Heat Application Research Center, Sector of Nuclear Science Research,** conducts R&D on technologies for high-temperature gas-cooled reactors (HTGRs) and thermochemical hydrogen production at the Oarai Research and Development Center.
7. **The Sector of Fast Reactor Research and Development** is conducting R&D toward the establishment of fast reactor (FR) cycles to address long-term energy security and global environmental issues. In Tsuruga, staff at the Prototype Fast Breeder Reactor Monju and the Monju Project Management and Engineering Center are conducting R&D on "MONJU". R&D activities are also aimed at enhancing the safety of the FR system at the Oarai Research and Development Center and at manufacturing plutonium fuel and reprocessing spent FBR fuel at the Nuclear Fuel Cycle Engineering Laboratories.
8. **The Sector of Decommissioning and Radioactive Waste Management** develops technologies for the safe and rational decommissioning of nuclear power facilities as well as measures for processing and disposing of radioactive waste in their R&D centers or institutes. This sector also conducts multidisciplinary R&D aimed at improving the reliability of geological isolation of high-level radioactive waste in Japan. A particular focus involves establishing techniques for investigating the deep geological environment through R&D at the Tono Geoscience Center and the Horonobe Underground Research Center. At the Nuclear Fuel Cycle Engineering Laboratories, the focus is on improving the technologies for disposal facility design and safety assessment. Additionally, ongoing work is focused on the development of a next-generation knowledge management system based on the above R&D activities. Furthermore, the development of nuclear fuel cycle technology for LWRs is in progress at the Nuclear Fuel Cycle Engineering Laboratories.
9. **The Sector of Fusion Research and Development** is performing fusion R&D as a domestic agency of the International Thermonuclear Experimental Reactor (ITER) project and as an implementing agency of the Broader Approach (BA) activities. The procurement activity of the ITER project, upgrade of JT-60 into a superconducting machine as a BA activity, fusion plasma research, and R&D on various elemental technologies are being conducted at the Naka Fusion Institute. Moreover, the International Fusion Energy Research Center project and the Engineering Validation and Engineering Design Activities of the International Fusion Material Irradiation Facility as a BA activity are mainly being performed at the Rokkasho Fusion Institute. Nuclear fusion research development was taken over to the National Institutes for Quantum and Radiological Science and Technology (QST) established in April 2016.
10. **The Center for Computational Science & e-Systems** performs research on advanced simulation technology and on basic technology in computational science, and also operates and maintains computer systems. These efforts are mainly conducted at the Nuclear Science Research Institute and the Kashiwa Office.
11. **The Integrated Support Center for Nuclear Nonproliferation and Nuclear Security** plays an active role in technology development in the field of nuclear nonproliferation and nuclear security in international organizations, such as IAEA, and each country, activities to contribute nuclear material management and peaceful uses on ensuring transparency, and policy research. And ISCN continues human capacity development support projects which contribute the capacity building in Asian countries. These efforts are carried out mainly at the Head Office and the Nuclear Science Research Institute.

R&D Institutes/Centers of JAEA