

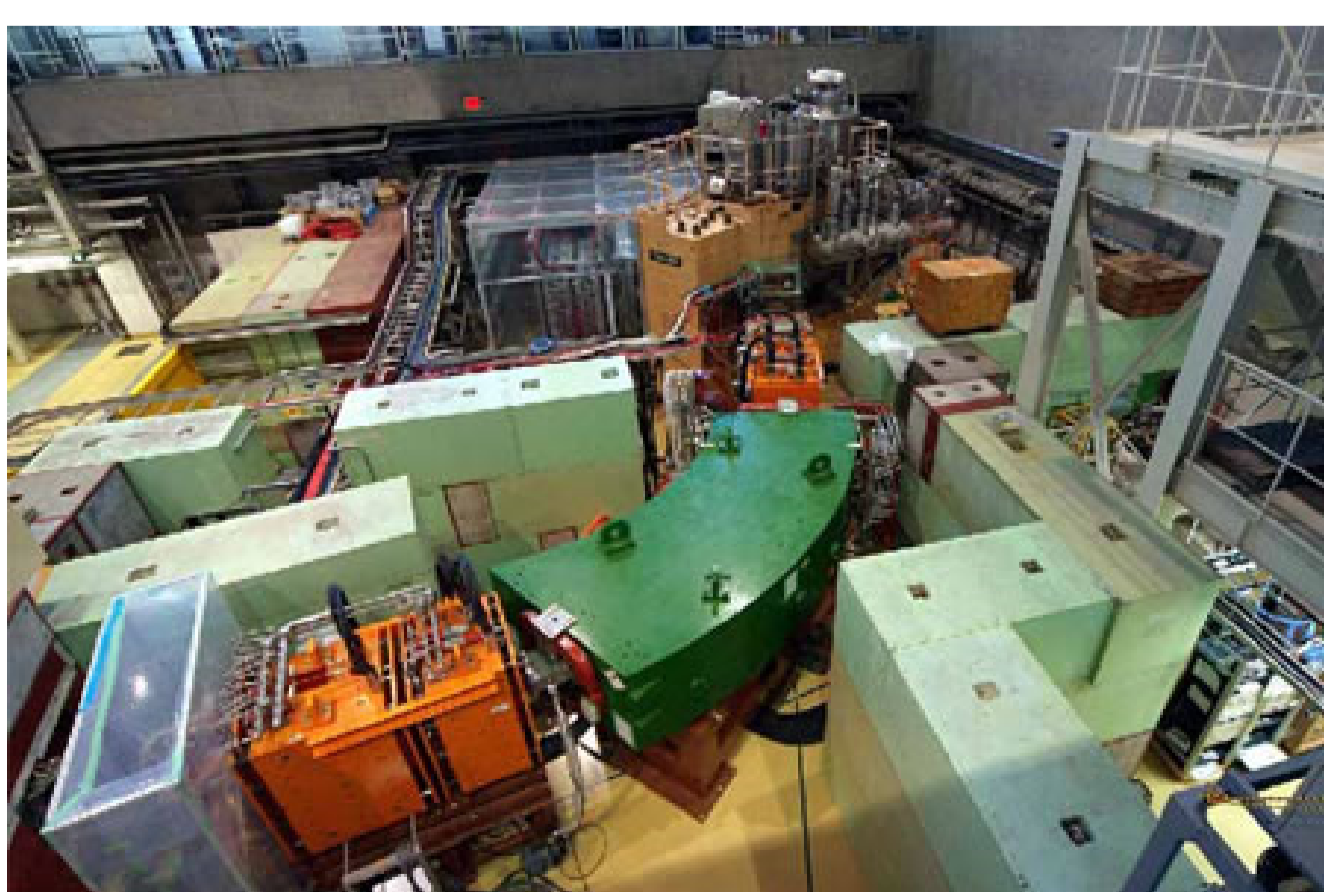
General information

J-PARC has three proton accelerators (400-MeV Linac, 3-GeV Synchrotron, and 50-GeV Synchrotron) with MW-class high power beams, generating secondary-particle beams of neutron, muon, pion, kaon, and neutrino. With using these secondary particle beams, cutting-edge research across a wide range of scientific fields, nuclear and particle physics, materials and life sciences, and nuclear technology, is conducted. J-PARC is jointly built and operated by two organizations, Japan Atomic Energy Agency (JAEA) and High Energy Accelerator Research Organization (KEK). The facility is located in the Tokai village, Ibaraki prefecture, Japan.



History

- 2001: Construction started
- 2007: Linac accelerates beam to 181 MeV. 3-GeV synchrotron accelerates beam to 3 GeV.
- 2008: 50-GeV synchrotron accelerates beam to 30 GeV.
- 2011: J-PARC was damaged by the great east Japan earthquake.
- 2013: Radioactive material leak incident occurred at the hadron exp. facility.
- 2014: Linac accelerates beam to 400 MeV.
- 2015: Hadron experimental facility resumed its operation.



Projects

Accelerator

For realizing 1 MW power beam at 3-GeV synchrotron, the energy upgrade of the linac from 180 MeV to 400 MeV was achieved in January, 2014, and a high-current ion source has just been installed. Beam loss at 3-GeV synchrotron was demonstrated to be small enough for higher intensity beams. The 50-GeV synchrotron has a plan to increase beam power to 0.75 MW.



Nuclear and particle physics

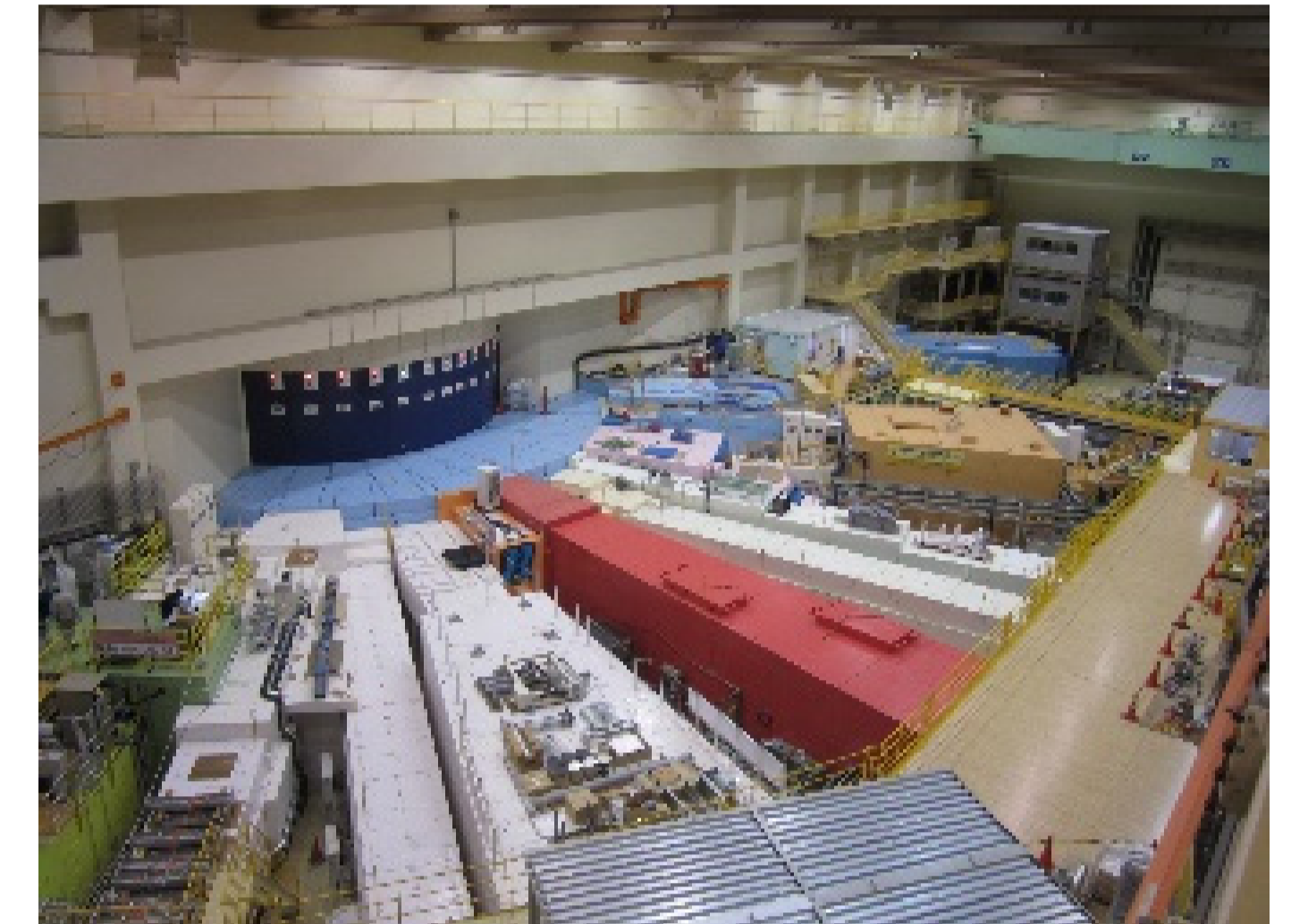
At the hadron experimental facility, various nuclear and particle physics researches, such as hyper nuclei and rare kaon decay experiments, are carried out. The facility had suspended its operation since the radioactive material leak incident on May, 2013. Improvements of the facility and the hardware for securing more safety (improving interlock system, installation of newly-designed target system contained in an airtight chamber, and improving air-tightness of the primary beam line area, etc.) and reconstruction of the safety management system in the J-PARC center had been coped with, finally the hadron experimental facility resumed its operation from April, 2015.

At the neutrino experimental facility, T2K experiment, in which high-intensity neutrino beams are directed from J-PARC towards Super-Kamiokande, is continued using about 450 kW proton beams on target.



Material and life science

At the Materials and Life Science Experimental Facility (MLF), extensive scientific programs, such as condensed-matter physics, materials science, industrial applications, structural biology, and nuclear particle physics, are covered. MLF provides the world highest-class flux of neutrons and muons using 3-GeV proton beams (157 kW : June, 2017). Twenty-one instruments are placed in neutron beam lines and several instruments are placed in four muon ports.



Safety / HSE

In addition to the radiation hazard that personnel may be exposed to, release of radioactive materials into the environment should be concerned, in particular, at the exchange of highly radioactivated targets. Other hazards are similar to those found in industry, such as crane operation, work at high place, electrical equipment, high-pressure gas, liquefied gas, chemicals, and operation of lasers. High-risk work, such as an exchange of the mercury target vessel for neutron production and the beam windows for primary proton beams, should be reviewed in advance. The hazards resulting from the specific user experiments are also checked by the facility staff members.

Safety division is independent of other divisions of J-PARC. The safety division has two sections of radiation safety (25 members of staff) and general safety (11 members of staff). Because J-PARC does not have corporate status, J-PARC relies on JAEA and KEK for issues relating to occupational safety and health.

