

## **Towards the Acceleration of Decommissioning** **Efforts of Nuclear Plant Decommissioning Safety Research Establishment**

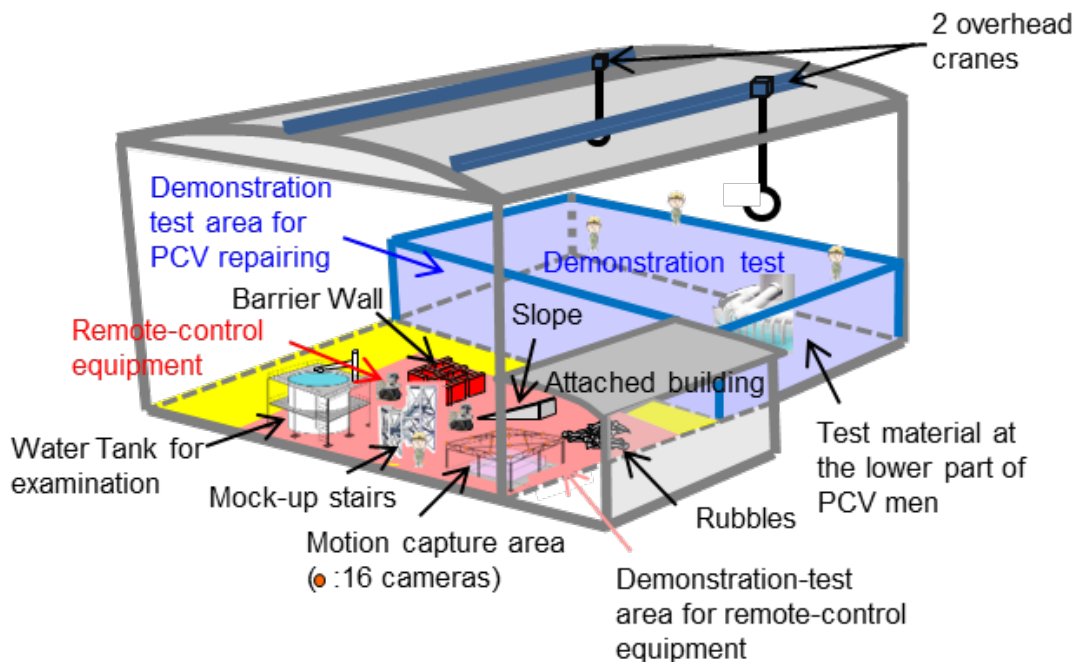
The Nuclear Plant Decommissioning Safety Research Establishment, Japan Atomic Energy Agency (JAEA), was established on 1st April, 2013 for the purpose of performing research and development on the decommissioning of Fukushima Daiichi Nuclear Power Station (hereinafter referred to as 1F). The mission of the Nuclear Plant Decommissioning Safety Research Establishment is classified into two subjects. One is to develop technologies for removing nuclear fuel debris\* from nuclear reactors of 1F. The other is to develop technologies related to disposal of wastes produced by the decommissioning of 1F.

Concerning the removal of nuclear fuel debris, the development of remote control equipment (robot) is necessary for the purpose of, 1) investigating the status of the reactors, 2) decontamination works, and 3) stopping the water leakage from the lower part of primary containment vessel (PCV). For the actual removal of nuclear fuel debris, the development of other remote control equipment is required, because there are places where workers cannot access for high radiation dose.

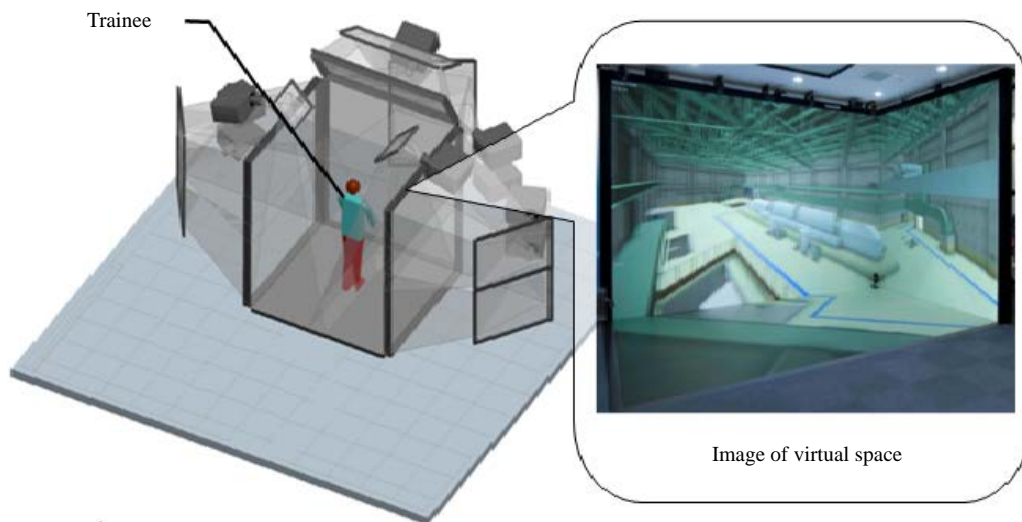
\* debris: fuel assembly in primary containment vessel (PCV), once melted and then solidified with the other materials

### **Outline of Remote-control and Device Development Facility**

As a facility to develop such technologies, a facility for the development and demonstration test of remote control equipment and devices (hereinafter referred to as Mock-up Testing Facility) will be constructed in Naraha Town, Fukushima Prefecture. The contract of the construction was concluded in August 2014, and the construction of the facility is scheduled to be completed by the end of fiscal year 2015. The Mock-up Testing Facility consists of a Research Administration Building (four-storied building, 35 m × 25 m × 20 m) and a Demonstration Test Building (one-storied building, 60 m × 80 m × 40 m). In the Research Administration Building, up-to-date virtual reality system to examine operation procedure of the remote control equipment and to train operators is planned to be developed and installed. In the Demonstration Test Building, various types of test facilities will be installed, such as a facility to perform demonstration tests of technology for repairing and stopping water leakage at the lower part of PCV, and a facility to conduct demonstration tests of remote control equipment which are necessary for the investigation and decontamination of the 1F building. In addition, robot simulators that improve the efficiency of the development by checking the function of the equipment before its fabrication will be developed in cooperation with other research organizations. The Mock-up Testing Facility will contribute to variety of examinations required for the decommissioning of 1F as flexibly as possible.



**Layout plan of the Test Building of Mock-up Testing Facility**



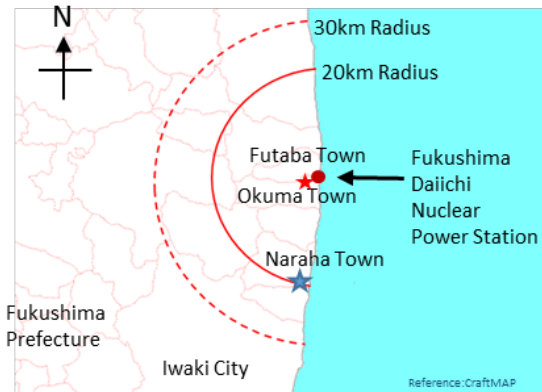
**Image of virtual reality system**

### **Outline of Radioactive Material Analysis and Research Facility**

The other mission of the Nuclear Plant Decommissioning Safety Research Establishment is the development of the technologies required for the processing and disposal of radioactive wastes generated by the decommissioning of 1F. For the processing and disposal of radioactive wastes, various technologies are required such as, 1) analyzing and evaluating properties of radioactive wastes (evaluation of species and physical properties of radioactive nuclides, etc.), 2) evaluating the safety of radioactive waste during the storage, 3) demonstration tests to make radioactive wastes into disposable forms, and 4) evaluating the safety of the disposal. To develop such technologies, the Nuclear Plant Decommissioning Safety Research Establishment has been constructing a facility for analysis and research of radioactive materials at the adjacent site of 1F in Okuma Town, Fukushima Prefecture. The facility consists of two laboratories. One is for dealing with low-level rubbles and secondary wastes produced from contaminated water. This will be constructed as a first step, and scheduled to open in fiscal year 2018. As a second step, the other one for dealing with high-level secondary wastes produced from contaminated water and fuel debris will be constructed, and it is scheduled to open in fiscal year 2020.

★ : Mock-up Testing Facility

★ : Radioactive Material Analysis and Research Facility



### Analysis of radioactive materials using radiation-shielded cell called “Hot Cell”

### Location of research and development facilities established by Nuclear Plant Decommissioning Safety Research Establishment

These research and development facilities will be managed in a manner that is easily used by both domestic and foreign researchers, and a new research system will be established to attract not only specialists in this field but also researchers in other various research fields for conducting research and development together. As a base for sending information on the research and development of decommissioning, the Nuclear Plant Decommissioning Safety Research Establishment will challenge new research topics, and bring up young researchers and engineers. It also aims to become an international base of research and development, which will contribute to improving the safety of the nuclear power stations in the world.

#### **TOPICS Fukushima No.52**

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