

13. Division of Deuterium Experiments Management

Division of Deuterium Experiments Management

The deuterium experiment has been carried out on LHD since March 7, 2017. Objectives of the deuterium experiments are (1) to realize of high-performance plasmas by confinement improvement and by the improved heating devices and other facilities, (2) to explore the isotope effect study, (3) to demonstrate the confinement capability of energetic particles (EPs) in helical system and to explore their confinement studies in toroidal plasmas, and (4) to proceed with the extended studies on Plasma-Material Interactions (PMI) with longer time scales.

The agreement for the environmental conservation and the LHD deuterium experiment was concluded between NIFS and the local government bodies of Toki-city, Tajimi-city, Mizunami-city, and Gifu-Prefecture in March 2013. After that, the preparation for the deuterium experiment has been carried out.

The Division of Deuterium experiments management was founded to establish the safety management system and to consolidate experimental apparatus related to the deuterium experiments. To accelerate the preparation for the deuterium experiments, a taskforce named “Deuterium Experiment Preparation Taskforce” was established under this division and was renamed to “Deuterium experiment management assistance taskforce” after the start of the deuterium experiment. The main jobs of this taskforce were (1) the establishment and modification of manuals to operate LHD and peripheral devices safely during deuterium experiments, (2) check and modification of the regulations related to proceeding with the deuterium experiments safely, (3) the upgrade of LHD itself, its peripheral devices, and the interlock systems for the safe operation during the deuterium experiments, (4) upgrade and optimization of heating devices and diagnostic systems for the deuterium experiments, (5) remodeling the LHD building and related facilities, and so on. These jobs proceed with the cooperation of the LHD board meeting and the division of health and safety promotion. In addition, the necessary tasks related to the safety evaluation committee founded by NIFS and those related to the safety inspection committee for the National Institute for Fusion Science (NIFS) founded by local government bodies are discussed in this division.

The cooperation with the safety inspection committee of NIFS is an important task to the divisions of the deuterium experiments management. The environmental neutron dose monitoring at NIFS and the tritium concentration monitoring in the environmental water around NIFS has been performed by the committee since 2015. In FY 2016, these monitoring activities were performed twice as scheduled under the cooperation with the division of the deuterium experiment management.

The publication of an annual report for the radiation management at the LHD deuterium experiment is another important task of this division.

a)



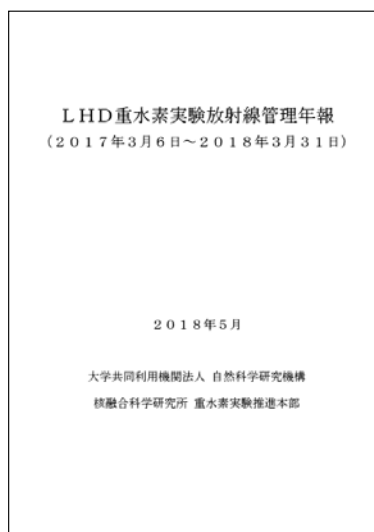
b)



c)



d)



(a) The photographs at the environmental water sampling with the secretariat of the safety inspection committee. (b) The real-time radiation monitoring post where the cooperative environmental neutron monitoring is performed with the secretariat. (c) Additional neutron dosimeters placed by the secretariat of the safety inspection committee (left) and by the division of deuterium experiment management (right) near the radiation monitoring post at the cooperative environmental neutron monitoring with the secretariat. (d) The front cover of the annual report for the radiation management at the first LHD deuterium experiment (written in Japanese).

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