

11. Division of Deuterium Experiments Management

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

Division of Deuterium Experiments Management was founded to establish a safety management system and to consolidate experimental apparatus related to deuterium experiments. After the start of deuterium experiments in the LHD, the function of this division was shifted to the management of their safe and reliable operation. Under this division, a taskforce named ‘the deuterium experiment management assistance taskforce’ was founded. Its main jobs were: (1) the establishment and improvement of manuals to operate the LHD and peripheral devices safely during deuterium experiments, (2) check and improve regulations related to proceeding with the deuterium experiments safely, (3) an upgrade of the LHD itself, its peripheral devices and the interlock systems for safe operation during the deuterium experiments, (4) upgrade and optimize heating devices and diagnostic systems for the deuterium experiments, (5) remodel the LHD building and related facilities, and so on. These jobs proceeded with the cooperation of an LHD board meeting and the Division of Health and Safety Promotion. In addition, necessary tasks related to the safety evaluation committee founded by NIFS and those related to the Safety Inspection Committee of the National Institute for Fusion Science (NIFS) founded by local government bodies proceeded in this division. The publication of an annual report for radiation management of the LHD deuterium experiments is another of its important tasks.

Cooperation with the Safety Inspection Committee for NIFS, which is organized by local government bodies, such as those in Gifu Prefecture, Toki City, Tajimi City, and Mizunami City, is an important task of the Division of Deuterium Experiments Management. Environmental neutron dose monitoring at NIFS and tritium concentration monitoring in the water around the NIFS has been performed by the committee since 2015. In 2022 FY, these monitoring activities were performed twice, as scheduled with the cooperation of the Division of Deuterium Experiments Management.

Because deuterium experiments in the LHD ended in 2022 FY, the function of this division is going to merge with that of the Division of Health and Safety Promotion, as a part of its remit in 2023 FY.

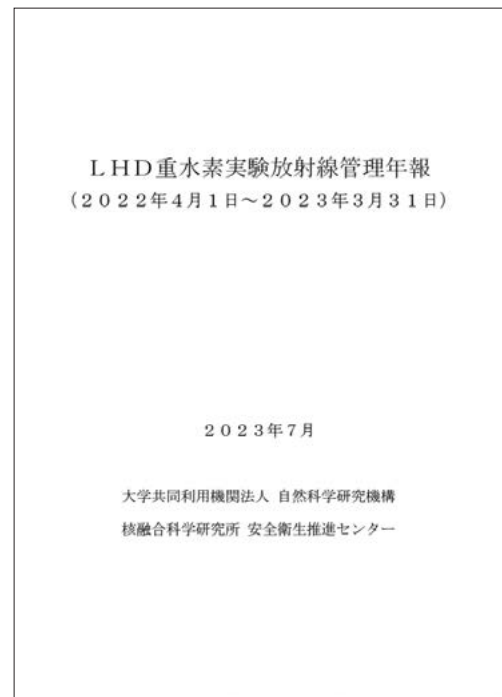
(a)



(b)



(c)



Photographs of (a) environmental water sampling and (b) environmental radiation dose rating with Secretariat of Safety Inspection Committee. (c) Front cover of Annual Report on radiation management at first LHD deuterium experiment (in Japanese).

(M. Osakabe and M. Isobe)