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The Accomplishments of Lithium Target and Test Facility Validation Activities in the IFMIF/EVEDA Phase

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Validation activities for key systems of the Lithium Facility and the Test Facility of the International Fusion Materials Irradiation Facility IFMIF were performed during the Engineering Validation and Engineering Design Activities phase 2007 - 2015 by Japanese and EU Research Units. A fully functional lithium loop with a 1:3 scaled target were constructed and run in Oarai, Japan. The lithium target, which acts as neutron source together with the IFMIF 2x125mA 40MeV deuteron accelerators, has proven long term stability, and fulfilling the requirements on low surface waviness. Two types of high flux test modules were developed and tested in Japan and EU. Both types demonstrated to fulfill their thermal-hydraulic requirements and ability to keep the contained material specimens in low temperature spread conditions. Further research was done for the development of Small Specimen Test Technique.

In conclusion, the validation activities for the IFMIF Lithium- and Test Facilities were able to demonstrate major achievements for the design of critical components, and furthermore, give valuable impulses for the further development of IFMIF systems, which are currently ongoing in EU and Japanese R&D activities, aiming at the realization of an early neutron source for DEMO.

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