



Contribution ID: 507

Type: **not specified**

P4.172 Fusion Technology Facilities & H3AT at UKAEA

Thursday, 20 September 2018 11:00 (2 hours)

The UK Government has invested ~€100M to create two new UKAEA centres for fusion research – Hydrogen-3 Advanced Technology (H3AT) and the Fusion Technology Facilities (FTF) both opening in 2020-21. FTF and H3AT will foster close cooperation with industry, academia and other international laboratories to develop and transfer knowledge between partners, offering opportunities to undertake R&D to reduce risk for ITER and to make significant contributions to the EU DEMO and international fusion programmes.

The FTF offers a complete development life cycle for materials and components in three facilities. The Materials Technology Laboratory develops and qualifies materials using small sample testing techniques to reduce costs and offer in-service testing. The Joining and Advanced Manufacturing Laboratory specialises in material joining and manufacturing technologies for fusion including additive manufacture and laser welding. It has a dedicated small sample test facility, HIVE, capable of providing up to 20MWm⁻² over 20x20mm. The Module Test Facility provides fusion relevant testing environments, with heat flux up to 2MWm⁻² (and higher localised flux) and DEMO relevant water cooling loop for metre-scale components.

At the heart of the H3AT facility will be a fusion relevant 100g tritium processing loop comprising of storage beds and distribution system, impurity processing system, isotope separation system and systems to detritiate water and air. These will service a flexible suite of enclosures and glove boxes to allow a broad range of tests and experiments. In addition the facility will contain a dedicated area to develop materials detritiation processes, a wet chemistry lab and a facility to handle other beta emitting gases.

This paper will describe the new facilities in terms of their technical capabilities and the progress to their realisation.

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Session Classification: P4