

Upgraded Materials Research Facility empowers fusion research

The UK Atomic Energy Authority (UKAEA) has completed a £10m extension of its world-leading Materials Research Facility (MRF) at Culham Science Centre in Oxfordshire.

Specialist materials that can withstand extreme conditions are a critical part of delivering fusion energy as a safe, sustainable, low carbon energy supply. They are also essential in the development of STEP (Spherical Tokamak for Energy Production), the UK's prototype fusion powerplant targeting operations by 2040.

The new investment has doubled the MRF size, providing an additional 12 shielded research rooms, used to hold high-end analytical instrumentation, as well as extensive new active chemical laboratory space, for scientists and engineers to develop more neutron tolerant materials.

Amanda Quadling, UKAEA's MRF Director, said ahead of today's official opening:

"Developing novel materials for resilience to fusion's triple whammy of tritium permeation, transmutation and atomic displacement effects is one of the grand challenges in delivering fusion power to the grid by mid-century.

"We're really proud of our extended MRF facility, which is one of the best of its kind in the world and provides collaborative space to bring together academic and industrial researchers. Also, by co-locating experimentalists and modellers, we hope to incubate new approaches to materials qualification for fusion."

Supported by the UK government's National Nuclear User Facility (NNUF) and Fusion Foundations programme, the MRF is also part of the Henry Royce Institute for Advanced Materials and bridges the gap between university and nuclear licenced site laboratories.

UKAEA staff provide users with support in sample preparation and analysis, as well as logistics advice for the transport of active materials. Focus is on the development of new analytical techniques specific to fusion materials, as well as the output of engineering-relevant data for powerplant design engineers and regulators.

The MRF extension doubles the current capacity for internationally leading equipment, enables air-lock truck deliveries to the operational areas and has more office accommodation.

Find out more about using the MRF and how to apply for access: mrf.ukaea.uk