

Royce Materials for Nuclear Energy Theme

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HENRY
ROYCE
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What's Happened?

Shifting from infrastructure to doing things with it

Royce funded buildings in Manchester and Sheffield now moving to fit-out

Research Workshop Feb 2020

Complementary to NNUF facilities

Research Workshop

February 2020; over 100 attendees

Focus on research themes- Additive Manufacturing; Codes & Standards; Corrosion; Fuel Manufacturing; Materials Archive; Degradation in Radiation Environments; Plutonium; Spent Oxide Fuel; Structural Materials; Waste Treatment

Several emerging proposals aimed at EPSRC

Some other proposals identified which Royce can support

Two industry-led proposals

All slowed down by Covid



HADES update

HADES Facility for High Activity Decommissioning Engineering – Science

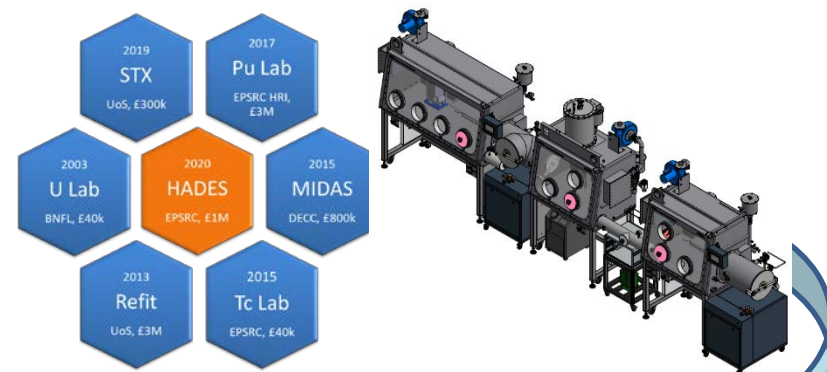
Incorporates BEIS, NNUF and HRI funded facilities and equipment into single accessible entity.

Key milestones for 2020:

- Completion of new HRI radiochemistry lab in RDC
- Procured HRI Pu materials chemistry glove box
- Facility expansion through NNUF2 award
- Joint stakeholder engagement workshop
- Strategic agreement signed with NIST
- Lab XAS facility and NSLS-II beamline access

Access via equipment funded route (NNUF or HRI)

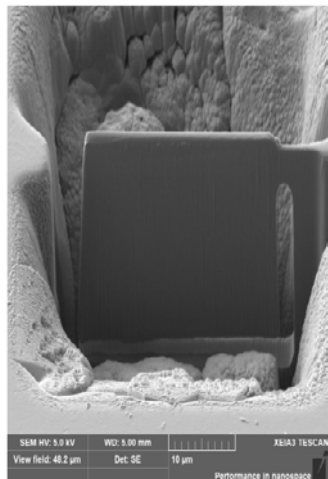
Next steps: install and commission HRI funded Pu materials chemistry glovebox.



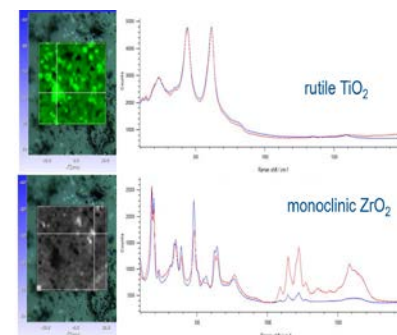
Royce Discovery Centre, aka Harry Brearley building, handed over July 2020.

New Royce Equipment at NNL (Sellafield site)

Tescan XEIA3 Plasma FIB with SIMS (Being commissioned)



Micro-Raman Spectroscopy (Alpha active glovebox environment & also Fumehood) (Commissioned)



Hot Cell Optical Microscope with Triple Raman Spectroscopy and Micro- mechanical Test Capability (Being commissioned in cell)



Available for academic users in
2021

Contact
access.liaison@uknnl.com

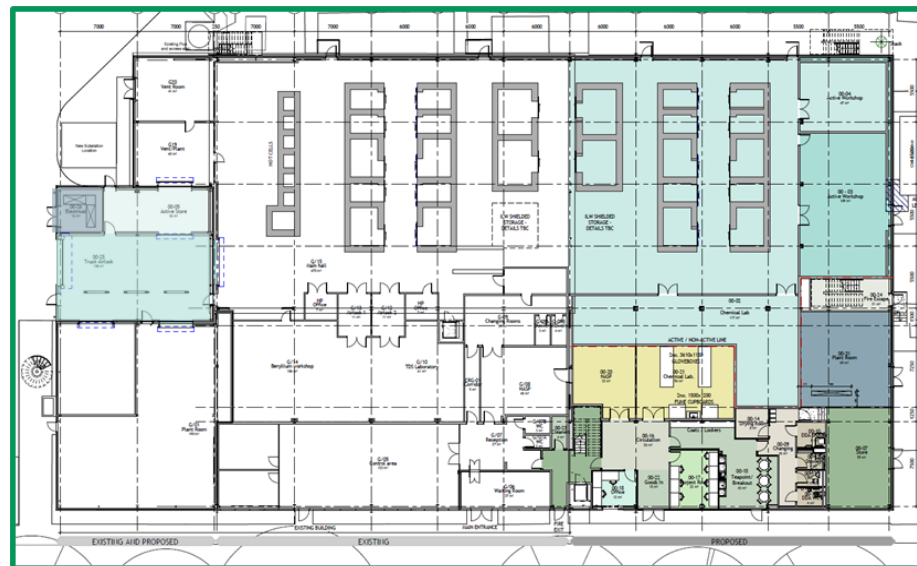


Hot cells for processing material (TBq)

1. Processing in hot cells plus a wide range of instruments in shielded rooms. <https://mrf.ukaea.uk/>
2. We are open for business again after lockdown, with external users now back on site. **Talk to us about your needs and how to apply for NNUF "Free at the Point of Access" funding (all our equipment qualifies).**
3. We applied to NNUF 2a for further equipment – many thanks to all the academics who helped us.
4. Contract placed soon to double size of the building.



Inside a shielded research room (GBq), showing robotic loading for the SEM.



MRF extension (2000 to 4000 m²): new area in blue.

Royce Hub Building- Manchester

Handed over March 2020

Now moving to fitout and commissioning

Nuclear Floor will house Fuels and Irradiated Materials facilities

Complemented by NNUF funded alpha active FIB and TEM

Safety and Security cases being developed with NNL support

Commissioning and operation delayed by Covid. Schedule currently being developed



DCF Summary of outputs 01/09/19 – 31/08/2020 (No activity 17/03/20 – 01/07/20 due to COVID-19)

User community: The following organisations have utilised our experimental capability (typically on multiple occasions):

Universities: Oxford, Liverpool, Sheffield, Leeds, Queen's Belfast, Lancaster, Ulster, Sheffield Hallam, Exeter, Essex

Industry; UKAEA, Jacobs, NNL, ABSL Space Products, Infinite Power Co. Ltd, Mirion, Croda,

Total usage by external organisations was around 2200 hours

Facility status & capability development:

Phased restart to research commenced 01/07/20. Reopened to external users 01/08/20.

Ongoing development includes; X-ray cabinet irradiator, active handling capability, Ion accelerators – in-situ EELS & SIMS.

Outputs:

Over 25 peer reviewed publications co-authored by DCF staff and/or acknowledging use of DCF experimental facilities