Contribution ID: **32** Type: **Oral**

UK fuel cycle R&D in Advanced Nuclear Fuels

Monday, 22 September 2014 11:30 (30 minutes)

The depth and breadth of ceramic fuels manufacture R&D capability within the UK is based on decades of support to UK industry programmes together with involvement in international programmes. With the closure of the final UK programme in this area these skills are likely to diminish without other programmes being implemented to sustain them.
In response to concerns relating to the UK's Nuclear R&D capability the UK Government has published an R&D Roadmap [ ] (Nuclear Energy Research and Development Roadmap: Future Pathways) which sets out a vision for nuclear research and development and the research outcomes that would be needed to support future energy policy decisions. It also makes the case that Government will need to take action to maintain an agile and flexible R&D capability to ensure that informed decisions can be made.
The Government's R&D roadmap cites research objectives for the short and long term including; protecting and developing nuclear fission skills and knowledge, development of organisational infrastructure and re-engagement with international collaborative programmes.
Part of the Government's long term vision is to equip the UK to supply the fuel needs for Generation III+, Generation IV and Small Modular Reactor reactors globally. Part of this vision includes the facilities of a newly established Nuclear Fuel Centre of Excellence (NFCE), for housing this fuel R&D equipment. The NFCE is a novel concept which involves the establishment of a world class capability within existing facilities operated by the UK's National Nuclear Laboratory and the University of Manchester. These facilities will need to handle quantities of active materials including alpha active materials and house the required material performance testing and analysis equipment.
To attain a world-leading fuel manufacturing status will require fundamental research into fuel material performance and new and improved fabrication technology, and this research will need to be conducted by subject matter experts who have access to world-leading facilities. The establishment of a UK Nuclear Fuel Centre of Excellence would provide this, and see industry, NNL and academia engage in national and international collaborative research in advanced fuel manufacturing technology. The NFCE will be open to international partners, offering world-leading capability and facilities in advanced fuel fabrication R&D, complementing international facilities such as the Halden and Jules Horowitz Test Reactors.

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Session Classification: Fuel Production

Track Classification: Fuel Production Facilities