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An e-learning tool on Fast Reactors and their Fuel Cycles

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The United Kingdom was one of the countries pioneering fast reactor development and demonstration with the construction and operation of two fast neutron spectrum reactors at the Dounreay site; multiple support facilities including zero-power and thermal hydraulic facilities; and demonstrated several sustainable and closed fuel cycles. Since the end of the UK Fast Reactor Programme in 1994 much of the knowledge acquired has been lost or at best archived. The UK National Nuclear Laboratory (NNL), as part of the Department for Business, Energy and Industrial Strategy's (BEIS) £505m Energy Innovation Programme –which includes the biggest nuclear fission investment in a generation, is leading on the Advanced Fuel Cycle Programme (AFCP). This work has begun activities aimed at ensuring this globally unique and highly valuable resource is not lost, through a Fast Reactor Knowledge Capture project.

A key feature of the AFCP is to support the next generation of technical experts, especially the development of these skills in early career individuals from across the nuclear sector. Using information captured from the UK's historic fast reactor programme, a number of online e-learning training modules are to be developed in partnership with the International Atomic Energy Agency (IAEA). These resources are being developed as part of the recently announced NNL-IAEA Collaborating Centre on the Advanced Fuel Cycle. Through the Centre, the IAEA, NNL and UK partners will collaborate on a number of topics relating to the development of advanced fuels and fuel cycles required to power the reactors of the future. The collaboration will place particular emphasis on the exchange of technical expertise between the UK, IAEA and Member State representatives, and in supporting the development of the next generation of experts.

The proposed approach to develop the e-learning module is discussed, focusing on the modular nature to allow the addition to incorporate further topics as they are produced as well as the interactive nature. This will be followed by an overview of the content that provides part of the of the "Background and Introduction"section on Fast Reactors and the planned fuel manufacture and reprocessing content. In summary, the development of future fast reactor experts is a timely and costly endeavour. To support and accelerate the realisation of this aim, modern and interactive training techniques befitting the 21st century should be sought and developed that utilise the historic knowledge developed from research and reactor operations.

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