UK Nuclear Academics Meeting David Eaves Chief Technical Officer, Springfields Fuels Limited.



The Clean Energy Technology Park is the UK's nuclear licensed site open to technology developers, innovators, supply chain and academia to co-locate and collaborate.





Springfields



Springfields

Clean Energy Technology Park

• Launched on the 28th February 2020



Build a centre of excellence for nuclear materials management delivering a one stop shop to meet customers needs.



Develop advanced fuel technologies, harnessing the worldleading manufacturing facilities and operational excellence which already exist on the Springfields site.



Develop and demonstrate advanced nuclear technologies including SMR, Gen IV, fusion and related industrial and medical applications.



www.cetpspringfields.com

Clean Energy Technology Park - Vision







Westinghouse Lead Fast Reactor



UK-BEIS Advanced Modular Reactor Phase 2

Westinghouse-led team recently awarded (~£10M) by BEIS as part of Phase 2 of the Advanced Modular Reactor program

Program goals:

- Accelerate LFR technology development
- De-risk the program to further increase opportunities for private and public funding
- Strengthen the UK supply chain to streamline domestic delivery of nuclear power plants
- Enhance the Springfields' Clean Energy Technology Park as a hub for advanced reactor technology development

> Program objectives:

- Confirm enablers for economic competitiveness / business case including:
 - High-temperature materials and fuel systems
 - High-importance plant components/systems

Key deliverables:

- State-of-the art test facilities to support LFR technology development
- Experimental data to confirm technical feasibility and performance



Westinghouse – Reactor portfolio

AP1000 [™] PWR	Westinghouse LFR	eVinci™
The Westinghouse AP1000		
1100MWe	460 MWe	1 to 5MWe
 Gen III+ 2-loop PWR Passive safety Modular design 4 units completed 2 units in-construction 15-100% load-follow capability 	 Gen IV Lead Fast Reactor Competitive in challenging global markets Walk-away safe Energy storage for non- reactor-based load-follow Non-electricity applications Supporting both open and closed fuel cycle 	 Transportable Factory built & fuelled 40 yrs design life, 3+ years of continuous operation Zero emergency planning zone Autonomous load-follow



Westinghouse Lead Fast Reactor

- Westinghouse's GenIV technology of choice to address needs of future centralized global markets
- Primary mission: economic competitiveness
 - Front-end capital cost affordability combined with stepchange in cost of electricity
 - Flexible electricity through thermal energy storage for cost-effective complementation of renewables
 - Capability for non-electricity applications, e.g. process heat
 - Fuel cycle advantages typical of fast reactors
- A modern, walk-away safe fast reactor, developed in collaboration with domestic and international partners







Coated cladding and links with NNL AFCP



Coated Cladding Technology Scale-Up

- Springfields are working with NNL and Teer Coatings through the BEIS Advanced Fuel Cycle Programme to develop Cr coated Zr alloy cladding technology, for improved accident tolerance and wear resistance.
- The magnetron sputtering technique deposits dense, adherent coatings that require no further post processing.
- The system being fabricated is due to be installed in SFL facilities in early 2021, with potential to coat full length Zr alloy tubing qualified for Lead Test Rod (LTR) insertions in commercial reactors.
- An extensive testing programme is in progress to underpin LTR insertions (40m of coated cladding already supplied to Westinghouse in the US with complementary testing on-going in the UK).
- A further scale-up of the technology for commercial throughput requirements is under consideration.



