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Providing A nuclear fuel Cycle In the uk For Implementing Carbon reduction (PACIFIC)

Funded by EPSRC and Industry - £3.75M

Principle Investigators: Prof. Tim Abram (University of Manchester) - Fuels

Prof. Bruce Hanson (University of Leeds) - Separations

Imperial College London

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MANCHESTER 1824 The University of Manchester

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LANCASTER UNIVERSITY

THE UNIVERSITY OF EDINBURGH

The University Of Sheffield.

University of Reading

Westinghouse

EDF ENERGY

UCL

University of BRISTOL

UNIVERSITY OF CAMBRIDGE

UNIVERSITY OF OXFORD

National Nuclear Laboratory

ROLLS ROYCE Rolls-Royce

Providing A nuclear fuel Cycle In the uk For Implementing Carbon reduction (PACIFIC)

- Overall objective – prove the concept of recycling from thermal to fast reactors
- Strategic view (Nuclear Fission Technology Roadmap) – likely to be advanced Purex for separations
- Programme Objectives:
  - Build a sustainable academic consortium in Nuclear Fuel Technology with strong links into other UK and international Universities, National Laboratories, Regulatory Organisations, and Industries.
  - Conduct academically excellent research in key aspects of nuclear fuel technology, underpinned by strong analytical modelling methods and experimental programmes.
  - Pursue a range of research topics that address key aspects of current generation nuclear fuel performance, as well as more advanced fuel technology options.
  - Engage with partner organisations to identify opportunities for collaboration and to access relevant data, expertise, facilities, etc.
  - Train a cohort of young PhD and post-doctoral researchers in nuclear fuel technology that will be available to meet future UK research, regulatory, and industrial needs.

Providing A nuclear fuel Cycle In the uk For Implementing Carbon reduction (PACIFIC) – Fuels Theme

	Title of Project	Lead Investigator	Partners
In-Reactor Damage Effects in Advanced Ceramic Fuels and Coatings			
1	**Fuel Modelling**	R Grimes	Imperial College, Cambridge Manchester, Leeds Westinghouse
2	**Thin Film and Fuel Pellet Sample Manufacture**	T Scott	Bristol, Manchester, NNL
3	**Advanced TRISO Coated Particle Fuel**	P Xiao	Manchester, NNL
4	**Materials Characterisation and Irradiation**	T Abram	Manchester, Bristol, NNL
In-Reactor Damage Effects in Cladding Materials			
1	**Mechanistic Study of Pellet-Cladding Interaction**	M Preuss	Manchester, Imperial College, Westinghouse

Providing A nuclear fuel Cycle In the uk For Implementing Carbon reduction (PACIFIC) – Separations Theme

Research Area	Title of Project	Lead Investigator	University
Minor actinide separation	Direct monitoring of speciation in fuel cycle separations	S Faulkner	Oxford
	Optimising Interfacial Transfer Kinetics During Nuclear Separations	C Boxall	Lancaster
	Actinide behaviour and radiolysis effects of complexants in advanced separations	C Sharrad	Manchester
	Actinide Separation and Selective Extraction Technology (ASSET)	L Harwood	Reading

Providing A nuclear fuel Cycle In the uk For Implementing Carbon reduction (PACIFIC) – Separations Theme

Research Area	Title of Project	Lead Investigator	University
Advanced separations technology	Developing a better understanding of conventional solvent extraction technology	B Hanson	Leeds
	Intensified separation using impinging jets	P Angeli	UCL
	Development of high efficiency coalescers and settlers	B Hanson	Leeds
	Continuous Chromatographic Separation of Actinides and Fission Products	H Eccles	Uclan

Providing A nuclear fuel Cycle In the uk For Implementing Carbon reduction (PACIFIC) – Separations Theme

Research Area	Title of Project	Lead Investigator	University
Product conversion to fuel	The Conversion of Mixed Fuel Oxides to Fuels and Fuel precursors using Molten Salt systems	A Mount	Edinburgh
	Electro-reduction of spent nuclear fuel oxides for separation and conversion to fuel precursors	D Brett	UCL
	Decontamination and immobilisation of pyroprocessing wastes	N Hyatt	Sheffield

To date…

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- Links with EU programmes (SACSESS, GENIORS) well embedded with three projects sharing/leveraging resources in the Reprocessing domain in.
- Access to NNL Central Lab offered as a contribution in kind.
- Shared facilities at Lancaster (UTGARD) and Manchester (DCF) have been made available to researchers across the programme..
- Cross disciplinary team effort involving chemists & engineers
- The programme has provided five PhD, plus over 10 Early Career Researchers to add to the UK's skills base.