

Workpackage I

“Fuel, thermal hydraulics & reactor systems”

S P Walker

WP I Investigators

Simon Walker (Imperial) (WP I Lead)

Brian Axcel (Manchester)

Mark Cotton (Manchester)

Tony Goddard (Imperial)

Geoff Hewitt (Imperial)

Dominique Laurence (Manchester)

Hewitt & Walker (Imperial)

- Water reactor design basis accident studies
(Large break LOCA, re-flood, interactions of thermal hydraulics and mechanical deformation of the core)
- Inorganic salt deposits ('crud') on PWR fuel
(Altered heat transfer modes, thermal hydraulic and neutronic effects)
- Computational methods development for elastodynamic NDT

Academic Staff

Simon Walker, Mike Bluck (Mech Eng), Geoff Hewitt (Chem Eng)

KNOO-supported:

Colin Hale, Despoina Chatzikiriakou, Caroline Masson, Soleman Maudarboucas, Jessy Zeng, Panos Sfikas

Laurence, Axcel & Cotton (Manchester)

- Application of advanced CFD to Generation IV systems
(Heat transfer in ceramic fuel structures: construction of a wall-resolved Large Eddy Simulation database for flow parallel to fuel rods)
- Validation of Reynolds-Averaged-Navier-Stokes turbulence models
(Exploitation of the LES database for the validation of RANS models; Cross-cutting with WP4 - Optimization of fuel/coolant exchanges for novel fuel element surfaces)
- Thermal striping in liquid-metal-cooled fast reactors
(Application of the wall-resolved LES treatment to wall-jet geometries including conjugate fluid/solid heat transfer)

Academic Staff:

Dominique Laurence, Brian Axcel, Mark Cotton (School of Mechanical, Aerospace & Civil Engineering, 'MACE')

KNOO-supported:

Yacine Addad, Amir Keshmiri, Stefano Rolfo

Goddard & Pain (Imperial)

- Coupled fault transient modelling framework for innovative reactors

Academic Staff

Tony Goddard, Chris Pain