

Work Package 2

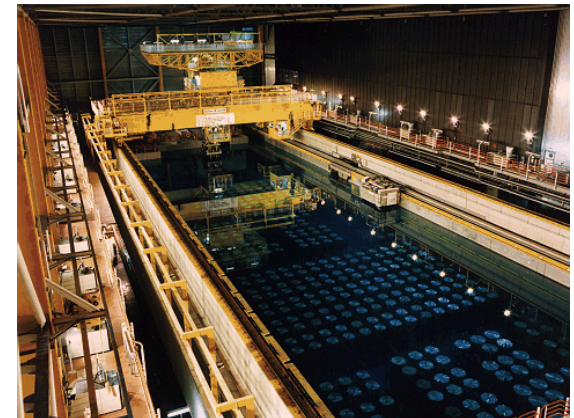
Materials Consortium

Performance of stainless steels
in nuclear environments

Degradation of stainless steels in nuclear environments

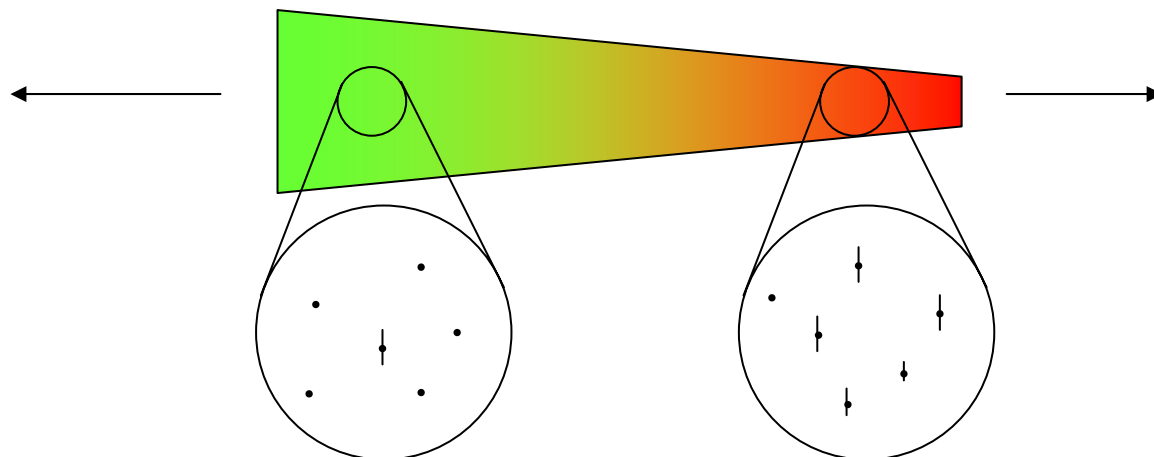
Aims and Objectives

- To establish new methods that enhance the understanding and prediction of stainless steel performance in nuclear environments
 - Mechanistic understanding of atmospheric influences on long-term external corrosion of ILW waste containers
 - Predictive modelling of materials and environmental factors on SCC of stainless steel
 - Understanding irradiation effects on the SCC susceptibility of AGR fuel can material in pond storage
 - Modelling helium embrittlement on the properties of stainless steels



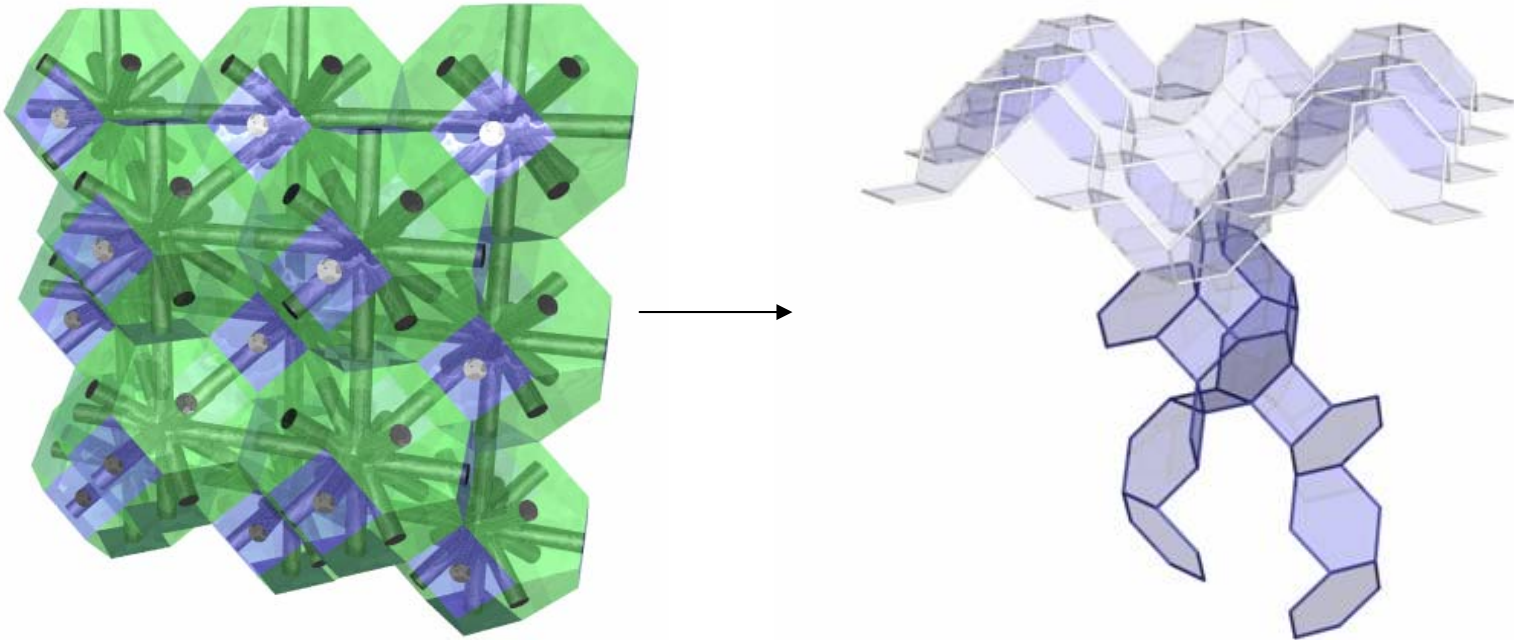
Mechanistic understanding of atmospheric influences on long-term external corrosion of ILW waste containers

- Development of a novel experimental method to explore the influence of stress alongside environment parameters (chloride concentration, temperature, humidity) on SCC susceptibility
- Assessment of scanning techniques to quantify SCC crack initiation and growth



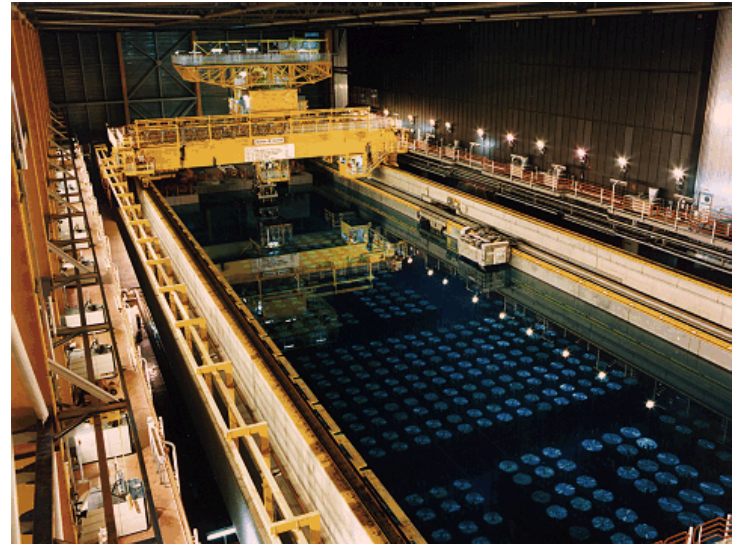
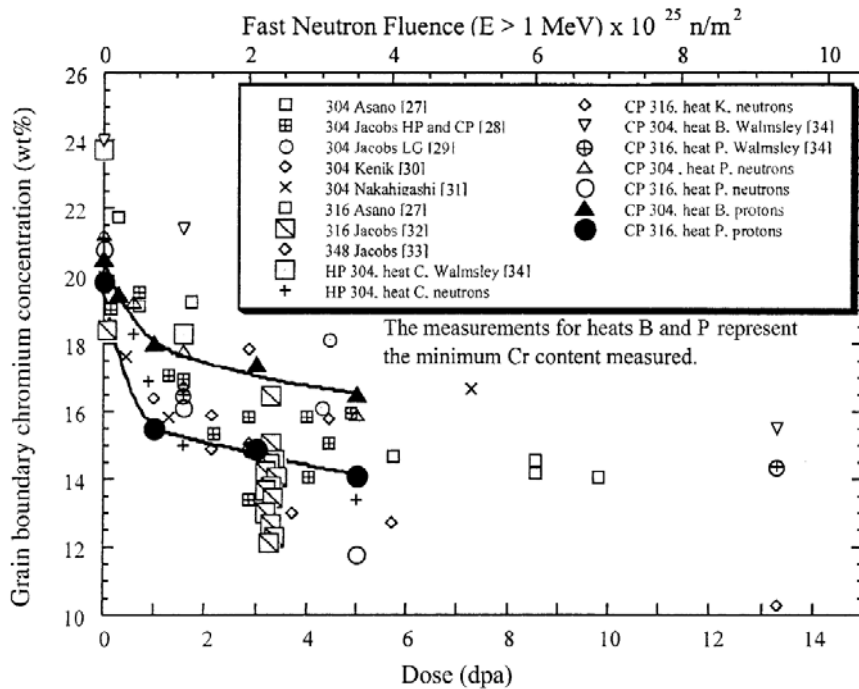
Predictive modelling of materials and environmental factors on SCC of stainless steel

- Development of a meso-scale modelling approach that simulates the microstructural, stress and kinetics factors on SCC development



Understanding irradiation effects on the SCC susceptibility of AGR fuel can material in pond storage

- Development of an understanding of the key factors that enhance and (or) inhibit SCC of spent fuel cladding materials in storage ponds



Modelling helium embrittlement on the properties of stainless steels

- Development of a modelling approach for the prediction of He effects on the flow and fracture of core materials

