

PROJECT REFERENCE NUMBER: IE-SFNR-2009(03)-30.2

Doctoral Research Project Title	Physical models for long-term integrity of key Generation IV nuclear components
Project Description	<p>The structural integrity and functioning of key reactor components, such as fuel cladding and intermediate heat exchangers, is fundamental for the nuclear safety, reliability of the energy production and for the economical competitiveness. The components in future reactors systems (Generation IV) will be subjected to very high temperatures, high levels of irradiation and aggressive environments and need to be designed against the associated degradation mechanisms (e.g. thermal and irradiation creep, fracture, embrittlement, corrosion). This will require development of new materials, as well as assessment of existing materials subjected to the relevant loads and environments.</p> <p>The objective is to develop physical models for the performance of Gen IV materials and components under normal and accident conditions. This requires that materials issues are addressed at different size and time scales. Such model development needs to be supported by material tests and microstructural analysis. The models then need to be implemented into computer codes for application of component simulation.</p> <p>The work will include experimental as well as analytical and computational parts but the specific contributions will be tailored to the competence of the candidate. It is very useful if the candidate has experience in advanced numerical modelling using FEM and scripting or advanced microstructural characterization using techniques such as SEM and TEM.</p>
Qualifications/Expertise needed	Candidates must have a PhD degree or relevant university degree in the areas of physics, materials science or engineering mechanics and at least 5 years experience (supported by a record of peer-reviewed publications). Ability to work in a multi-national team and a good level of spoken and written English is required.
Duration (Cat. 20+30: min. 12 months - max. 36 months; Cat. 40: min. 3 months - max. 24 months)	36 months
Location	Petten, The Netherlands
Scientific Responsible	Dr. Karl-Fredrik Nilsson, Dr. Peter Hähner

IE Mail Contact	karl-fredrik.nilsson@jrc.nl, peter.haehner@jrc.nl
-----------------	---

Further information and instructions on how to apply can be found at:

Institute for Energy

<http://ie.jrc.ec.europa.eu/jobs/granholders.php>