

BNS EVENING LECTURE

“SCIENTIFIC CONTEST: EDITION 2015”

March 26, 2015

TRACTEBEL ENGINEERING

"Radiation Effects in Structural Steels for Nuclear Applications: an Atomistic Study" by Alexander Bakaev

PhD in Physics, Universiteit Gent

This PhD thesis considers radiation damage in three groups of materials: austenitic stainless steels used in PWR internals, ferritic-martensitic steels to be used in next generation fission and future fusion reactors, and RPV steels currently used in PWRs. Time was devoted to the study of the nano-scale dislocation-defect interaction mechanisms, which may also provide an explanation for the formation of dislocation channels. Atomistic calculations were also applied to identify the mechanisms of nucleation of nanometer-scale solute-rich clusters under irradiation in mentioned steels.

"Provisions for the Dismantling of Industrial Installations: Analysis of European and Sectorial Approaches" by Bart Deconinck

Master in Sciences and Environment, Université Libre de Bruxelles

This work concerns different aspects related to the constitution of a fund with provisions for the dismantling of industrial installations. Today, only two sectors are legally concerned with this problem in Belgium: the nuclear installations (such as the power plants or research centres) and the offshore wind farms. In a third sector, landfills, the owner has the legal obligation to manage the site for a limited period of time after closure, but no obligation to create a fund dedicated to the dismantling, clean-up or final closure. A comparison is made between the different European approaches for the dismantling of nuclear installations. Besides the ecologic impact on the present and future population, the economic impact is also discussed.

"Implementation of a Full 3D Neutronic Model for Myrrha in RELAP5-3D using Nestle" by Marco De Lorenzo

Master in Nuclear and Energy Engineering, Politecnico di Torino

This Master Thesis is devoted to implement a coupled model between the neutronics and the thermal-hydraulics of the MYRRHA core. By modeling the core on the Monte Carlo code, Serpent, it was possible to construct a full 3D model of MYRRHA in the neutronic deterministic code called NESTLE. Afterwards, the model has been coupled with a simplified thermal-hydraulic scheme of the core on the safety simulation code, RELAP5-3D. The main aim was to investigate the presence of local effects and to quantify them in case of transients with local perturbations leading to reactivity variations. After the implementation on the codes, research was conducted to understand the differences between the outcomes of the simulation of the same accidental transient by the traditional Point-Kinetics and by the Nodal-Kinetics implemented before.

The Evening Lecture will start at 18:30.

Registration is required by March 23, 2015 on www.bnsorg.be