

NOMATEN Hybrid Seminar

Location: NOMATEN seminar room

Time: 1 PM

gotomeeting room (for online): <https://meet.goto.com/NCBJmeetings/nomaten-seminar>

Seminar date: April 2nd, 2024

Title: Results from characterization of Barsebäck 2 RPV weld materials

Speaker name: Jari Lydman

Speaker affiliation: Advanced Materials for Nuclear Energy, VTT, Finland

Abstract: The talk describes the investigations on high-Ni, high-Mn and low-Cu weld metals from the decommissioned Barsebäck 2 boiling water reactor (BWR) reactor pressure vessel (RPV). The reactor pressure vessel head (RPVH) weld and axial and circumferential beltline welds of the Barsebäck 2 RPV have been studied. The investigations include both mechanical testing (fracture toughness, impact toughness, tensile testing) and microstructural characterization but the talk will focus more on microstructure, fractography, primary initiation sites, the initiators of brittle fracture, and hardness through the RPV wall thickness.

Bio: Research areas: microstructural characterization, reactor pressure vessel investigation, failure case analyses. Jari Lydman has worked at VTT Technical Research Centre of Finland in Espoo for 14 years. His expertise is in the microstructural characterization of nuclear power plant (NPP) materials, reactor pressure vessel (RPV) investigations and failure case analysis. During his career at VTT, he has participated in several EU projects, such as SOTERIA, STRUMAT LTO and DELISA LTO, and national projects focused on studying the RPVs of operating and decommissioned NPPs, such as Barsebäck2 boiling water reactor (BWR) in Sweden and Bohunice VVER-440 pressurized water reactor (PWR) in Slovakia. The focus of the projects is on aging and radiation embrittlement and brittle fracture initiation. The results of the investigations are strongly related to the long-term operation (LTO) of the NPPs. Beyond RPV investigations, he has examined accident-tolerant fuel (ATF) claddings after high-temperature steam treatment and supercritical water (SCW) conditions. The research on ATF claddings has increased significantly after the accident in Fukushima Daiichi. He has experience for eight years in failure case analyses, which he has performed for various sectors of the Finnish industry. Jari Lydman holds a Master Science (M.Sc.) degree in Engineering Materials, which he obtained from Aalto University in December 2016. His M.Sc. thesis focused on the impact toughness and microstructural characterization of thermally aged Alloy 52 narrow-gap dissimilar metal weld (DMW) of the safe-end, which is a part of the primary loop of reactor pressure boundary, in the Olkiluoto 3 European Pressurized Water Reactor (EPR). The M.Sc. thesis was awarded by Yrjö and Senja Koivusen säätiö in 2017. Committed to advancing knowledge and collaboration within his field, he is an active member of the International Group on Radiation Degradation Mechanisms in Pressure Vessel Steels (IGRDM) and the Finnish Nuclear Society (Suomen atomiteknillinen seura, ATS).