Contribution ID: **346** Type: **Oral**

Experimental Investigation and Modeling of Passive DHRS with Plate-Type Compact Steam Generator

Within the EU-funded ELSMOR (Towards European Licencing of Small Modular Reactors) project, an experimental facility has been built at SIET (Piacenza, Italy) to test a passive Decay Heat Removal System (DHRS). Based on natural circulation, the main peculiarity is the adoption of a plate-type compact steam generator as heat source, whereas the heat sink is an in-pool condenser. An experimental campaign was conducted to investigate the effect of various parameters on the DHRS behavior, such as the secondary side filling ratio, the primary system temperature, the pool level, etc. The present activity simulated the ELSMOR test 00100_C where the reduction of the secondary side filling ratio is enough to trigger oscillations observed experimentally on the secondary side flow rate. Adopting the RELAP5 code, the simulations predicted the experimental data both qualitatively and quantitatively, promisingly encompassing the primary physical phenomena essential for the system's performance. Few discrepancies were noted in predicting the secondary side pressure, primary side compact steam generator outlet temperature and secondary side flow rate, highlighting the need for further code development and validation to support the adoption of compact heat transfer devices on safety related systems. In the context of advancing Small Modular Reactor (SMR) technologies, this paper contributes valuable insights into the validation of passive DHRS, addressing critical challenges and paving the way for enhanced safety and efficiency in future SMR deployments.

Country OR International Organization

Italy

Email address

andrea.missaglia@polimi.it

Confirm that the work is original and has not been published anywhere else

YES

Author: MISSAGLIA, Andrea (Politecnico di Milano)

Co-authors: ALEMBERTI, Alessandro (Ansaldo Nucleare); BERSANO, Andrea; LOMBARDO, Calogera (ENEA); CARAMELLO, Marco (Ansaldo Nucleare); RICOTTI, Marco (Politecnico di Milano); LORENZI, Stefano (Politecnico di Milano)

Presenter: MISSAGLIA, Andrea (Politecnico di Milano)

Track Classification: Topical Group A: SMR Design, Technology and Fuel Cycle: Track 1: Design and Technology Development of SMRs