EUROPEAN SEVERE ACCIDENT RESEARCH FACILITIES: MAPPING AND ANALYSIS

VICTOR HUGO SANCHEZ-ESPINOZA1*, PASCAL PILUSO2, LUIS ENRIQUE HERRANZ3

¹Karlsruhe Institute of Technology (KIT), 76131 Karlsruhe, Germany ²French Alternative Energies & Atomic Energy Commission (CEA), 13108 Cadarache, France ³Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), 28040 Madrid, Spain

* Corresponding author email: victor.sanchez@kit.edu

The Experimental facilities play a central role in safety analysis, especially in severe accident (SA) phenomena. Whether experimental data are used to demonstrate specific safety features of reactor designs or to develop and validate models and codes for safety analysis, the availability of well-designed and well-equipped experimental infrastructures is essential for enhancing nuclear safety.

Within the framework of the EU SEAKNOT (Severe Accident research and KNOwledge management; Grant agreement ID: 101060327), a comprehensive mapping in 2024 of European severe accident research facilities has been carried out, and a thorough description has been synthesized, from the design features to the main phenomena addressed by the latest research programs for LWRs (gen 2, 3 and 3+), including advanced technologies such as Advanced Technology Fuels (ATFs) and Small Modular Reactors (SMRs). The analysis of the compiled database has identified potential critical conditions for the next decade - such as human resources, preservation/enhancement of experimental competencies, and future plans - that could jeopardize current and future European experimental capabilities for severe accidents research, according to the SA PIRT and roadmap being developed in SEAKNOT. This paper presents the major outcomes of this study.

062_abstract_final_pp