

PASTEELS

Passive Systems: Simulating the Thermal-hydraulics with Experimental Studies

OBJECTIVES

The overall objective of PASTEELS is to improve the ability of European nuclear actors to design and deliver innovative passive safety systems and simulate their behaviour to support the safety demonstration.

PASTEELS aims at making significant progress in the study of two specific passive systems, the Containment Wall Condenser (CWC) and the Safety Condenser (SACO) by:

- Building on and leveraging existing available computational codes to simulate the relevant thermal-hydraulics phenomena,
- Developing a robust, validated, multi-scale simulation methodology of passive systems,
- Performing new experimental studies to obtain the relevant validation data.

EXPECTED IMPACTS

The successful achievement of the PASTEELS objectives could have the following positive impacts for the European nuclear industry:

- Increasing the safety of European NPPs: SACO and CWC are possible options to potentially increase safety and resilience during SBO scenario for instance (no need to any external electrical power supply to operate)
- Enhancing reliability of industrial design capabilities for European actors through the improvement of predictive numerical calculation in order to be able to propose optimised high-performance passive safety systems
- Enabling the future qualification of SACO and CWC technology for future implementation in NPPs: a reduction of 1-2 years is expected in the licensing timeframe for the introduction of such innovative passive systems
- Increasing the competitiveness of European NPP solutions by being able to offer these components and having an informed opinion on the interest of having such systems.

HIGHLIGHTS

The SACO and CWC technologies and accompanying models will reach TRL6 and TRL5 respectively through the ability to work with semi-industrial almost full scale representative operating conditions of the experimental test facilities (PKL & PASI).

A demonstration of the main PASTEELS results should be offered during the workshop for end-users scheduled for spring 2022 and during the PASTEELS Symposium scheduled at the end of the project.

PARTNERS

EDF, ENEA, CEA, Framatome GmbH, GRS, University of Stuttgart, IRSN, Lappeenranta-Lahti University of Technology, Paul Scherrer Institut, UJV REZ, a. s, ARTTIC

DURATION & BUDGET

09/2020 –02/2024 – 3,5 years
3,8 Million Euros

CONTACTS

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