Politecnico di Torino

ENERGETICS

Newcleo - Experimental Investigation of LFR-AS-30 SGTR event in large scale pool system

Funded By	Newcleo S.P.A. [P.iva/CF:12517780016]
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Context of the research activity	Lead-cooled Fast Reactors are recognized as one of the most promising solutions among GEN-IV nuclear reactors, capable to provide sustainable nuclear energy in the forthcoming years. Steam Generator Tube Rupture (SGTR) is one of the most important accidents that can challenge the safety of these types of reactors, and therefore it is being deeply investigated to ensure the safe operation of the system also in accidental conditions.
Objectives	The primary objective of the thesis work is the design of the test section for the integral effect test facility named CIRCE, which will be used in the experimental campaign that will focus on Steam Generator Tube Rupture (SGTR) related phenomena. A key outcome of this work will be the mechanical design of the pipe rupture system of the steam generator within the test section. Furthermore, the candidate is expected to closely follow the experimental campaign, ensuring that the thesis work is supplemented with a thorough analysis and interpretation of the experimental results.
Skills and competencies for the development of the activity	This project will require on one hand thermal-hydraulic and mechanical/structural competencies for the understanding of the physical phenomena being modelled; on the other hand, numerical modelling skills related to the computational analysis that will be performed to design the test section will be required and furtherly developed during the PhD activity, together with the data analysis techniques to be adopted during and after the experimental campaigns. The candidate will therefore focus on both the design aspects and the data analysis.