

Development of Lead-Cooled fast reactor technologies at ENEA Brasimone Research Centre

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In the framework of the GEN IV innovative nuclear system, the ENEA Brasimone RC is supporting the technological development of innovative nuclear system cooled by heavy liquid metals (HLM) and, in particular, by liquid lead.

ENEA Brasimone RC is currently involved in several HORIZON2020 project such as PATRICIA, PASCAL, ANSELMUS and INNUMAT.

Since 2013 ENEA has been member of the Fostering Alfred CONstruction (FALCON) international consortium in partnership with ANSALDO NUCLEARE and RATEN-ICN supporting the advanced lead-cooled fast reactor European demonstrator (ALFRED) to fully demonstrates the LFR technology viability.

Moreover, in 2022 ENEA and newcleo signed a framework agreement with the intention of exchanges information and knowledge for the construction of a lead-cooled nuclear prototype outside Italy. The main goal of this cooperation is the construction at the ENEA Brasimone site of an electrical prototype of the Lead-cooled Fast Reactor (LFR) system, to allow studying the thermodynamic, mechanical and functional performances.

That said, ENEA Brasimone RC host one of the largest European fleets of experimental facilities aiming at investigating HLM thermal-hydraulics, coolant chemistry control, corrosion behavior for structural materials, and material properties in HLM environment, as well as at developing corrosion-protective coatings, components, instrumentation, and innovative systems, supported by experiments and numerical tools.

Particular attention is paid to research activities on sever accident precursors in GEN IV lead-cooled fast reactors such as steam generator tube rupture and core flow blockages.

Moreover, experimental data on the simulation of postulated accidents are used to support the development and the validation of numerical tools for specific application to liquid metals.

Speaker Bio

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