

## ELSMOR

### Towards European Licensing of Small Modular Reactors

#### OBJECTIVES

The development of Light Water Small Modular Reactors (LW-SMRs) is internationally at the point where various designs are being proposed to be built all around the world. European stakeholders, including the industry, regulators, support organizations and the academia, must be prepared to be able to respond to this change. The ELSMOR project aims to enhance the European capability to assess and develop the innovative SMR concepts and their novel safety features. The work both aims to investigate the safety of the Light Water Small Modular Reactors holistically as well as to drill down in set of topics identified by the consortium to be the most vital in ensuring the compliance of the future SMRs to the safety objectives as established by the amended Directive 2009/71/Euratom.

ELSMOR advances the understanding and technological solutions pertaining to light water SMRs on several fronts: Collection, analysis, and dissemination of the information on the potential and challenges of Small Modular Reactors to various stakeholders, including the public, decision makers and regulators; Development of the high level methods to assess the safety of LW-SMRs; Improvement of the European experimental research infrastructure to assist in the evaluation of the novel safety features of the future LW-SMRs, and; Improvement of the European nuclear safety analysis codes to demonstrate the capability to assess the safety of the future LW-SMRs.

#### DESCRIPTION OF WORK

The project will produce a state-of-the-art review of the proposed near term LW-SMRs and their proposed safety features. A methodology for safety analysis will be developed for the innovative LW-SMRs based on the experience in both large reactor analysis methodology as well as the experience in implementing such high-level methodology for Generation IV reactors. The work on passive safety functions of LW-SMRs in ELSMOR will consist of both experimental and analytical assessments of key safety features. The exact solutions differ between the LW-SMR concepts, but in general the verification of the operation of the passive safety functions and the validation of the analysis codes are vital. An application of the developed safety case methodologies and models with a chosen reference design will be performed in order to demonstrate their applicability for real cases. The approach will focus on the safety features of the global design, but with special attention and effort on safety systems that differ from large PWRs.

#### MAIN RESULTS / HIGHLIGHTS

ELSMOR aims to produce novel systems engineering methodology for ensuring safety case for innovative solutions used by LW-SMRs, to investigate European experimental and modelling capabilities to verify those solutions and to increase European actors' competence in the assessment of safety functions of light water small modular reactors.

#### DURATION

9 / 2019 – 3/2023  
3.5 years

#### CONTACTS

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#### PARTNERS

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