# BESEP

# Benchmark Exercise on Safety Engineering Practices

## OBJECTIVES

The overall objective of BESEP is to support safety margins determination by developing best practices for safety requirements verification against external hazards, using efficient and integrated set of Safety Engineering practices and probabilistic safety assessment.

The benchmark exercise will:

- Define a benchmark baseline on safety requirements important for the licensing of nuclear power plant new builds and upgrades.
- Collect and group case studies on safety analysis of external hazards previously performed by the project partners.
- Perform comparison of case studies and generalized case study groups from viewpoints of safety margins determination, requirements verification, level of details in safety analysis and realism in quantification of safety margins.
- Evaluate possible successes and challenges of the applied Safety Engineering processes.
- Evaluate resilience of safety margins in case of design-basis exceeding external hazards.
- Evaluate the balance between the allocated analysis resources and the plant level risk significance of different external hazards using results from probabilistic safety assessments.
- Disseminate results to the nuclear community taking into account both senior and junior technical experts as well as managers and policy makers.

## EXPECTED IMPACTS

The impact of BESEP is the improved licensing process of nuclear power plant new builds and upgrades with better safety margins determination and safety requirements verification against external hazards.

The benchmark exercise will provide:

- Best practices for the verification of evolving and stringent safety requirements against external hazards.
- Guidance on the closer connection of deterministic and probabilistic safety analysis and human factors engineering for the determination and realistic quantification of safety margins.
- Guidance on the creation of graded approach for the deployment of more sophisticated safety analysis methods, such as upgrades of simulation tools, while maintaining the plant level risk balance originating from different external hazards.

## HIGHLIGHTS

- Collaboration of seven partners from six EU countries.
- Demonstration of compliance with evolving and stringent safety requirements.
- Benchmark on efficient and integrated set of Safety Engineering practices and probabilistic safety assessment.

## PARTNERS

Teknologian tutkimuskeskus VTT Oy / Électricité de France / NUBIKI Nuclear Safety Research Institute Ltd. / UJV REZ, a. s. / Fortum Power and Heat Oy / RELKO spol. s r.o. / Risk Pilot AB

## DURATION & BUDGET

9/2020 – 2/2024
3.5 years
2,76 milj.€

## CONTACTS

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## EVENTS

Dissemination events (to be announced later).

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