# ENTENTE

## European Database for Multiscale Modelling of Radiation Damage

## OBJECTIVES

The overarching objective of the European Database for Multiscale Modelling of Radiation Damage (ENTENTE) project is to capitalise on past projects and expert groups beyond national borders, to make modelling and experimental work on RPV steel embrittlement converge and reach an "entente" in terms of capturing the expansive knowledge on the relevant ageing phenomena. In this way ENTENTE contributes to the improved safety of Nuclear Power Plants (NPP) by enabling the development of quantitatively predictive and/or remediating tools or operational practices to support safe Long Term Operation, not only for the existing nuclear fleet, but also for new light water reactors (Gen III/III+). The aim is to develop innovative data management tools to maximise access to and utilisation of the results of the multiscale modelling programs. Such a database will improve upon the SOTERIA Platform, to test industrial reference cases, and to provide open access to this wealth of accumulated knowledge.

## EXPECTED IMPACTS

The ENTENTE database will gather both experimental data and modelling data (atomistic modelling, mesoscopic modelling, finite element modelling), thereby covering the full scope of interest for the understanding of RPV steel ageing under irradiation.

The ENTENTE database will enable the reuse of data of a given experiment at all the various scales involved, the reuse of data in future experiments performed, while enabling exchange of information between experiments and models and between different researchers. This will enhance the possibility of improving and optimizing both models and experiments on RPV steels hardening and embrittlement. The access to previous results will avoid duplication of experiments and facilitate the design of key gaps in the available data and knowledge on aging phenomena, enabling the optimisation of test matrices.

## HIGHLIGHTS

The project can be seen as three interconnected blocks:

- DATABASE Design
- ADVANCED experiments/models
- INNOVATIVE data analysis and hybrid models

Target data will be that generated during previous EURATOM projects (LONGLIFE, PERFORM60, SOTERIA, TAREG, PHARE) on RPV steels. Relevant data from non-EU projects, provided by consortium members (CRIEPI, SSTC NRS) will also be processed through the data collection workflow designed during the project. The exploitation of the ENTENTE data base, including the interface with SOTERIA Platform, will allow the integrity assessment of Reactor Pressure Vessel to be improved both in a Long Term Operation (LTO) perspective and for new Gen III+ reactors.

## PARTNERS

CIEMAT (Coord,) EDF, CRIEPI, FRA-G, UJV, NNL, BZN, CEA, HZDR, IMDEA, SCK•CEN, CCFE, CNRS, CHALM, KTH, UC, UBRIS, UWAR, UMAN, UA, UPC, UPM, SINTEC, PHIMECA, VTT, SSTC NRS, IRSN.

## DURATION & BUDGET

09/2020 – 08/2024 – 4 years
4 Million Euros

## CONTACTS

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## EVENTS

Mid-term Workshop -> PhD event+ Women-in-ENTENTE+ Common session with STRUMAT-LTO
Final Workshop -> Cross-cutting with material database projects and/or other H2020 projects on nuclear materials ageing. Exploitation Group results.

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