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SOTERIA, “Safe long term operation of light water reactors based on improved understanding of radiation effects”, is a project partly funded by the European Commission as part of the EU framework programme for Research and Innovation “Horizon 2020”.

The kick-off meeting of SOTERIA, which took place in Paris in September 2015, was the beginning of a project that gathers together 24 European research centres and industrial partners from 11 different countries. The project will run until 2019 under the coordination of CEA.

The main aim of SOTERIA is to improve the understanding and the prediction of ageing phenomena occurring in reactor pressure vessels (RPVs) and internals in order to ensure safe long-term operation (LTO) of existing European nuclear power plants (NPPs). This aim will be reached by providing further knowledge and tools to manage the ageing of NPPs.

The number of nuclear power plants worldwide which have been in operation for more than 30 years is constantly growing. At the same time, considering the increasing demand for power to meet not only the needs of population growth but also the economic growth and the stringent pressure from policy makers to produce “green energy”, it is a high priority for regulators and operators to continue operating NPPs beyond the time frame originally anticipated, extending it from 40 to 80 years. The key for this envisaged extension of plant lifetimes is to ensure operational safety.

In this sense, SOTERIA will support safe LTO through the accomplishment of four technical objectives:

- Performance of experiments aiming to explore neutron flux and fluence effects on RPV and internals in pressurised water reactors
- Assessment of the residual lifetime of RPV taking into account metallurgical heterogeneities



- Assessment of the effect of the chemical and radiation environment on cracking in internals
- Development of models for the assessment of ageing mechanisms in RPV and internals and set of a computer-based platform for modelling tools

The knowledge and tools generated in SOTERIA will contribute to improving EU nuclear safety policy, to increasing the leadership of the EU in safety related equipment and information and to enhancing NPP safety world-wide.