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Research and Innovation Action (RIA)

SOTERIA

Project title: **Safe long term operation of light water reactors based on improved understanding of radiation effects in nuclear structural materials**

Project coordinator: **Commissariat a l Energie Atomique et aux Energies Alternatives CEA, Paris, France**

HZDR participant: **Institute of Ion Beam Physics and Materials Research**

Project homepage: www.soteria-project.eu

Starting date: **01.09.2015**

Duration (months): **48**

Summary

The overall aim of the SOTERIA project is to improve the understanding of the ageing phenomena occurring in reactor pressure vessel (RPV) steels and in the internal steels (internals) in order to provide crucial information

to regulators and operators to ensure safe long-term operation (LTO) of existing European nuclear power plants (NPPs).

SOTERIA has set up a collaborative research consortium which gathers the main European research centres and industrial partners who will combine advanced modelling tools with the exploitation of experimental data to focus on four technical objectives:

- i) to carry out experiments aiming to explore flux and fluence effects on RPV and internals in pressurised water reactors,
- ii) to assess the residual lifetime of RPV taking into account metallurgical heterogeneities,
- iii) to assess the effect of the chemical and radiation environment on cracking in internals and
- iv) to develop modelling tools and provide a single platform integrating developed modelling tools and experimental data for reassessment of structural components during NPPs lifetime.

Building on industry-specific key questions and material, SOTERIA will fill current gaps in safety assessment related to ageing phenomena, by providing a set of modelling tools directly applicable in an industrial environment. Guidelines for better use of modelling, material testing reactors and surveillance data will also be an output of paramount importance.

Another important parallel objective is the education of the nuclear engineering and research community of SOTERIA results to improve and harmonise knowledge about NPPs ageing and thereby ensure a high impact of project results. 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 contribute to improved NPP safety world-wide. The SOTERIA proposal received the NUGENIA label on 10 August 2014.