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PRESS RELEASE

Launch of **ADVISE**, a EURATOM research project aiming at advancing the ultrasonic inspection of complex structured materials for which conventional ultrasonic techniques suffer from severe performance limitations due to the micro and/or macro-structure

In recent years, there has been increasing concern for safe long-term operation of existing European nuclear power plants.

The ultrasonic inspection of corrosion resistant alloys used in these plants – in particular claddings, austenitic welds and cast austenitic steels – is a long standing issue in the field of nuclear non-destructive testing and evaluation (NDT and NDE). For these materials, a complex microstructure is responsible for both structural noise and attenuation, thus degrading the performance of ultrasonic non-destructive testing.

At the same time plant owners wish to replace radiographic inspections by ultrasound as a less disruptive, safer and faster technique.

To address these issues and thereby keep on improving safety and reliability of Generation II and III reactors, there are still a number of technical breakthroughs to overcome, including the need to improve NDE techniques for complex structured material.

The ADVISE project

ADVISE (**ADV**anced **I**nspection of Complex **S**tructur**E**s) is a collaborative research project awarded 4.17 Million Euro funding from the European Commission's EURATOM programme under the Horizon 2020 framework programme for Research and Innovation.

Started in September 2017 and lasting 4 years, the project is coordinated by Andreas SCHUMM (Electricité de France) and brings together a multidisciplinary team with complementary expertise of leading experts and key stakeholders covering construction, operation, and all aspects of in-service inspection. They will collaborate for new nuclear power constructions, maintenance of ageing power stations and safe operation of plants at end of life, addressing both Western European and Russian designs. The ADVISE consortium is made of 13 organisations from 6 European countries which include United Kingdom, France, Germany, Lithuania, Czech Republic and Hungary.

The ADVISE project aims to enhance – and in some cases to enable for the first time – the ultrasonic inspection of complex structures materials in order to improve confidence in and reliability of the inspection of Generation II and III reactors.

The project aspires to increase the comprehension and modelling of complex structures for accurate prediction, to develop new tools for material characterisation and to provide advanced inspection and defect evaluation methods as well as assisted diagnostics.

The ambitions of ADVISE

ADVISE proposes a coordinated and novel approach which will enable the delivery of a set of techniques and methods answering the industrial and European endeavour to keep on improving and maintaining power plants safety and reliability across its territories. ADVISE will address the current inspection challenges by delivering documented capabilities for the identified classes of inspection problems, demonstrators on industrially relevant example cases and dedicated software tools.

The main output of the project is a step change improvement in performance in terms of inspectable depth, defect detection and characterisation accuracy. For austeno-ferritic cast components, an increase of the inspectable depth of 70 to 85 mm is aimed for. Equally importantly, the in-situ characterisation for specific inspections will provide the confidence needed to make safe decisions from measured indications without the significant conservatism that is needed in many cases currently.

Project partners

Électricité de France (France) • Imperial College of Science Technology and Medicine (UK) • Fraunhofer Institute for Non-destructive Testing (Germany) • Commissariat à l'énergie atomique et aux énergies alternatives (France) • ARTTIC (France) • University of Bristol (UK) • M 2 M (France) • Bay Zoltán Nonprofit Ltd. for Applied Research (Hungary) • Kaunas University of Technology (Lithuania) • EXTENDE (France) • Materials Testing Institute - University of Stuttgart (Germany) • AREVA Intercontrôle (France) • ÚJV Řež – Nuclear Research Institute (Republic Czech)

Contact details

Project Coordinator	ADVISE Project Office
Andreas SCHUMM EDF – R&D Site des Renardières 77818 MORET SUR LOING France Phone: +331 60 73 75 33 andreas.schumm@edf.fr	Andrea KUPERBERG ARTTIC 58A, rue du Dessous des Berges 75013 PARIS France Phone: +331 53 94 54 83 advise-arttic@eurtd.com

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