Passive Isolation Condenser

Results

Project Information

PIACE
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Euratom

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Closed project

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14 May 2019

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30 November 2022

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EU contribution
€ 2,247,229,76

Coordinated by
AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE

Italy

Deliverables

Documents, reports (13)

Webinars collection

The deliverable will address the outcomes of the webinars organized by PIACE and available on the official website
The report is devoted to the Virtual workshop Nuclear innovative technology enhancing safety of European citizens organized at the end of the project which is aimed at sharing the results of PIACE project while broadening the target audience through the participation of other nuclear innovators not involved in PIACE project.

Identification of enveloping transient and system configuration for reactor technologies of European interest
The deliverable contains the definition of enveloping transients of interest to be analyzed for the LFR and ADS reactors. These are the accidental scenario for the reactor technology for which the safety system is intended to provide the maximum benefit. Since the removal of the decay heat and the prevention of freezing are conflicting requirements, two opposition scenarios will be considered and described in the report.

Communication plan
The report will cover the communication plan and will contain well-planned and concerted actions aimed to promote PIACE ideas on innovative passive systems among the key nuclear industry players and its potentiality in increasing the safety of European citizens, as well as to ensure project visibility at international level.

Test Matrix Definition for the LFR reference reactor
The deliverable deals with the test matrix relevant for the experimental characterization on SIRIO facility, on its first configuration, for the LFR reference reactor technology. The test matrix will include operating parameters and operation procedure based on the feedback received from WP1, and it will take in account specific tests for STH code validation, needed for the activity scheduled on WP4.

Test Matrix Definition and Facility Upgrade for ADS reference Reactor
The report describes the SIRIO facility upgrading aiming at experimentally reproduce the behaviour of the selected ADS reference reactor technology (the MYRRHA reactor), the finalization of a test matrix suitable for characterizing the SIRIO facility application on MYRRHA reactor, and the pre-test simulations, through means of STH codes, of the planned experiments.

Project Presentation
The deliverable contains a short presentation of the project objectives and activities to be published for giving to the public at large an overview of the content of the project.

Modelling of safety system and safety analyses for reactor technologies of European interest
The report contains the description of the development or update of a model representative of the reactor coolant system and the safety system by means of the system code (RELAP5, TRACE, APROS, or alternative system code). Application of the numerical model and the simulation for the identified accident scenario(s) will be outlined.

**Test Matrix Definition and Facility Upgrade for PHWR reference Reactor**

Starting from the input provided by WP1, the following minimum set of operating parameters will be considered in the beginning in the test matrix for PHWR reference reactor: feedwater pressure in the secondary side of the Steam Generator, feedwater mass flow and temperature, Steam Generator water level and primary coolant temperature, as well as the DHR isolation condenser pressure and temperature. The parameters represent the starting point of facility upgrading able to ensure its integration in the safety system of PHWR. The appropriate instrumentation, components and layout as well as operation procedures will be provided.

**Test Matrix Definition and Facility Upgrade for BWR reference Reactor**

The report includes, in first place, a proposal of upgrade of the SIRIO facility regarding instrumentation, layout & components and logical controls needed to better simulate the phenomena and system behavior highlighted in WP1 for BWR. In second place, it includes a test matrix relevant for the experimental characterization on SIRIO facility, on the proposed upgraded configuration, for the BWR reference reactor technology.

**Plan for Exploitation and Dissemination of PIACE’s Results (PEDR)**

The plan contains the exploiting and dissemination measures to be adopted, consisting in: strategic vision on exploiting (objective, selection criteria for results and stakeholders), means for exploiting and dissemination, implementation plan for exploiting (actions, responsible and planning), dissemination plan for the overall project. The exploiting is oriented to the targeted audience able to speed the implementation of the innovative results (closer to market concept).

**Identification of the reference case 1 and 2**

The deliverable deals with the identification of the two further reference cases to be experimentally simulated on the SIRIO facility in an upgraded version. It will report based on WP2 outcomes the upgrading needed concerning instrumentations layout components operating parameters and logical controls needed for each reference systems as considered in the WP1 and analysed in the WP2.

**Test Matrix Definition and Facility Upgrade for PWR reference Reactor**

The deliverable will be based on the input provided by WP1. It will summarize the proposed SIRIO facility upgrades, which will be relevant for experimental
reproduction of the phenomena identified in the PWR reference reactor operation with isolation condenser. D2.3 will define the upgrades for the SIRIO facility: instrumentations, layout & components and logical controls needed to better simulate the phenomena and system behavior highlighted in WP1 for PWR. Moreover, the task will define the test matrix relevant for the experimental characterization on SIRIO facility, on the proposed upgraded configuration, for the PWR reference reactor technology. The test matrix will include operating parameters and operation procedures, defined by JSI with the support of SIET as facility operator, and will be based on the feedback received from WP1. The test matrix should also account for specific tests devoted to system code(s) validation needed for the activity scheduled on WP4.

Open Research Data Pilot (2)

Experimental Data Report for the LFR reference reactor

The deliverable will contain for the LFR reactor: description of the facility configuration, instrumented flow diagram, flow pipe layout drawings of the components, instrument list with calibration data, test matrix, test procedure, test result in graphic format and in numerical format, file, test result, validation, conclusions.

Data Management Plan

The report consist in the plan for the management of the data produced in the project. The report describes the data management life cycle for the data to be collected, processed and/or generated. I will include information on: the handling of research data during & after the end of the project, what data will be collected, processed and/or generated, which methodology & standards will be applied, whether data will be shared/made open access and how data will be curated & preserved (including after the end of the project).

Publications

Peer reviewed articles (2)

A COMPLETE PASIVE SAFETY SYSTEM FOR CANDU 6: A NOT TOO FAR BRIDGE

Author(s): Iulian Pavel NIȚĂ, Luminița NIȚULESCU
Published in: EMERG, Issue Volume VII, Issue 4/2021, 2021, ISSN 2668-7003
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