SEAKNOT

SEvere Accident Research and KNOwledge ManagemenT for LWRs

Add presenter name

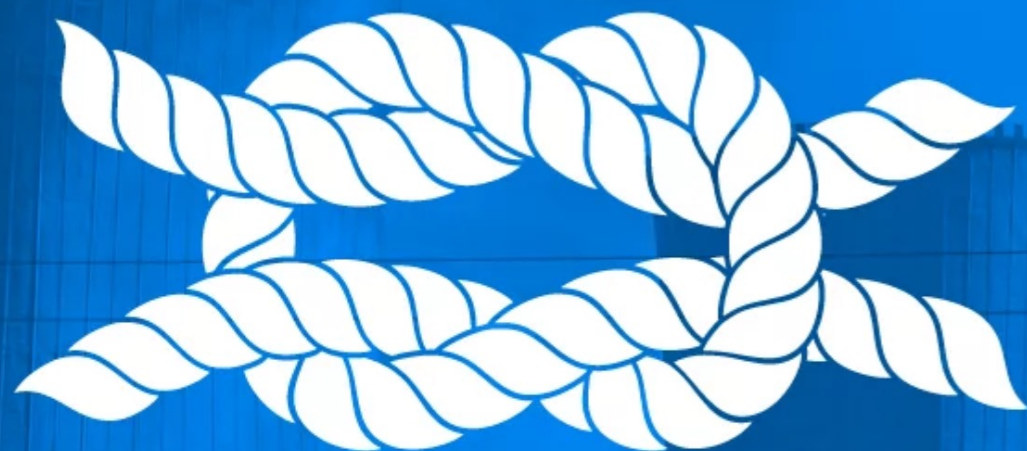## Add conference/meeting name

Add date and place

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ORGANIZATION
LOGO(S)

www.seaknot-project.eu

THE SEAKNOT WEBSITE

The aim of the four-year project is two-fold: to shape up a roadmap for severe accident research in the coming 10 years by means of which to achieve both a substantial reduction of remaining uncertainties and a measurable progress in the practical elimination of radiological consequences; and, no less important, to efficiently manage the knowledge and knowhow transfer to the young generation of nuclear scientists and engineers who will be involved in its implementation.

Coordinated by CIEMAT (Spain), SEAKNOT is constituted by seventeen well-known organizations from ten countries.

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Why SEAKNOT?

...At present time, when **some of the knowledge acquired on severe accidents (SA) is at risk of being lost** (as many specialists have already retired or are retiring) and **new approaches for the SA assessment are being explored** (as BEPU), it seems appropriate timing **to deeply review and document the sound existing background and project it into the future**...

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Background

- SEAKNOT is an idea – since 2019 – of the Coordination Team of the NUGENIA Technical Area 2 (TA2 - Severe accidents)

- NUGENIA TA2 (and previously SARNET) always committed to E&T (SAP Courses) and Dissemination actions (ERMSAR Conferences & SA textbook)

- SARNET network was inspired by the EC EURSAFE project, started in 2002 (first European SA PIRT using 2 criteria: importance for safety & level of knowledge)

- At the end of SARNET FP6 project in 2010, the update of this process led to select 6 R&D issues as highest priority, where the remaining uncertainties were judged still too high
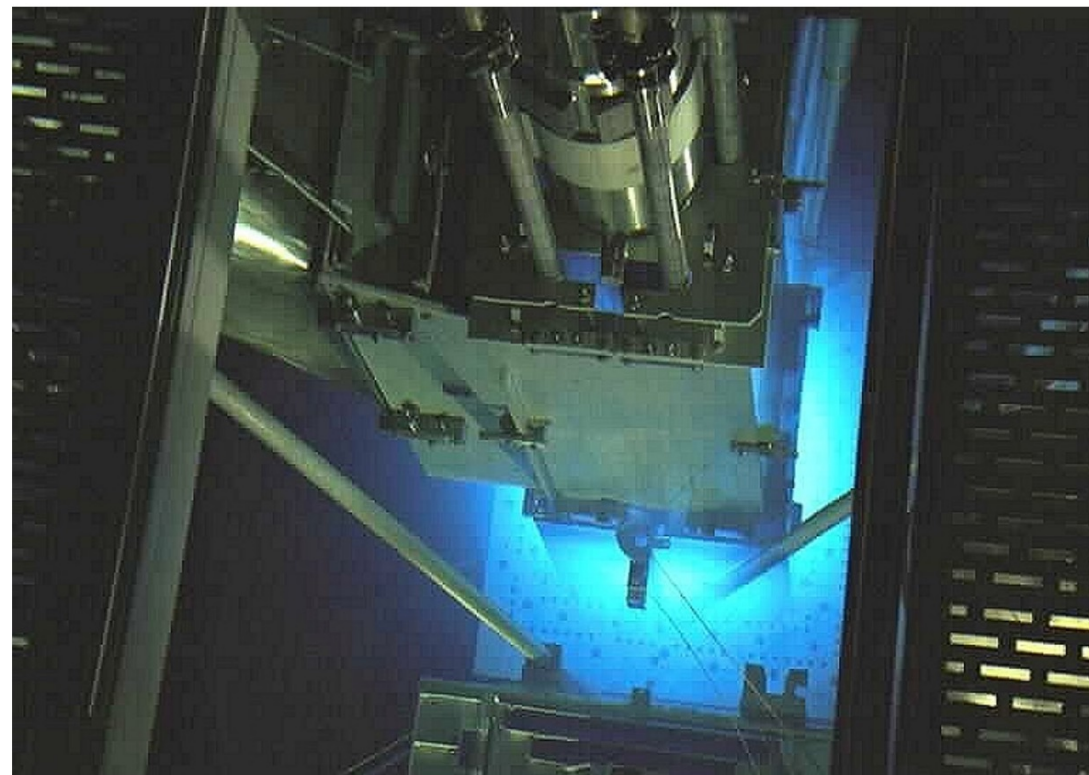
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NUGENIA TA2
Nuclear Generation II&III Alliance

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Motivations

- SA research priority is mostly based on *«expert's opinions»*, there is a need of a **soundly supported & integrated SA research roadmap**

- Vast background needs a *«vector»* to be properly transferred

- **Qualified experimentation is in the SA research DNA**

- Careful boundaries stretch to fit innovation (as ATFs and SMLWRs)
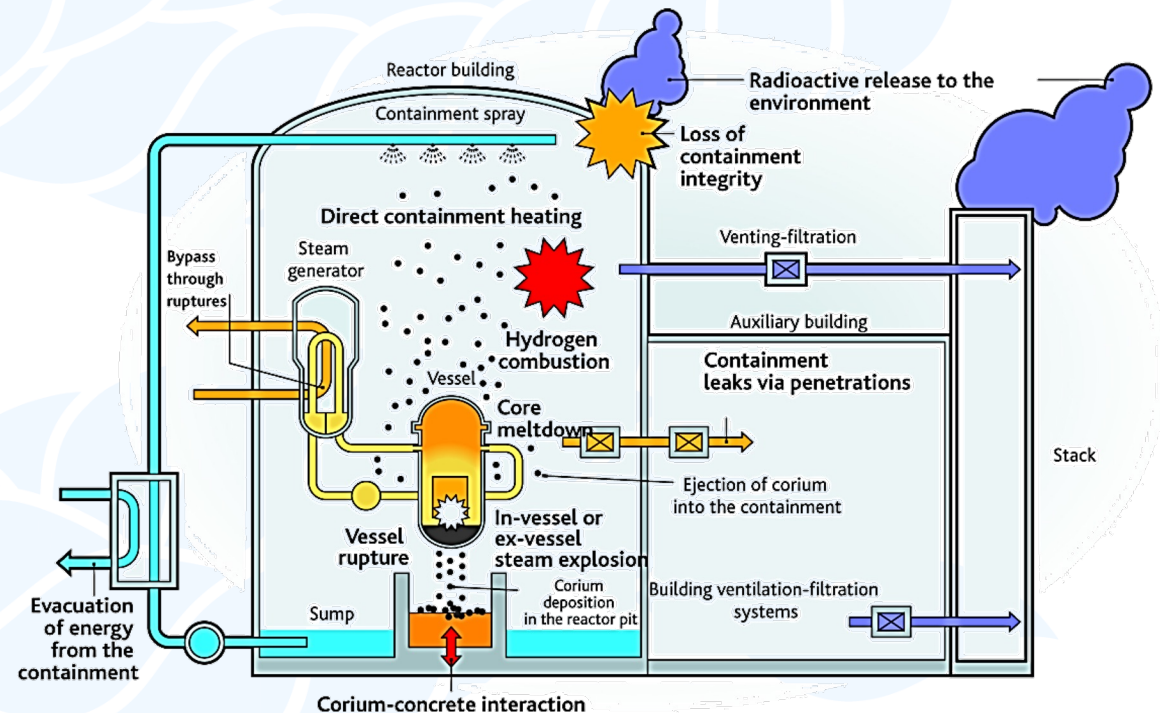

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SEAKNOT Main Objective

Management, Exploitation and Assessment of SA Knowledge

To achieve this objective, specific goals pursued:

- Carry out a critical analysis of current knowledge on SA

- Make recommendations for a further reduction of risks associated with nuclear technologies

- Identify experimental research needs

- Strengthen young generation background & skills

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Project Structure

Three types of activities

1) Assessment, Preservation & Dissemination
2) Building an integrated European SA Infrastructure of laboratories
3) Knowledge and Knowhow Transfer (K2T)

Five Work Packages (WP)

WP1 PIRTSA Phenomena Identification Ranking Table on SA

WP2 VADD Validation Database Directory

WP3 SAINET Severe experimental Accident Infrastructure NETwork

WP4 KNOS Knowledge Spreading

WP5 PROC Project Coordination
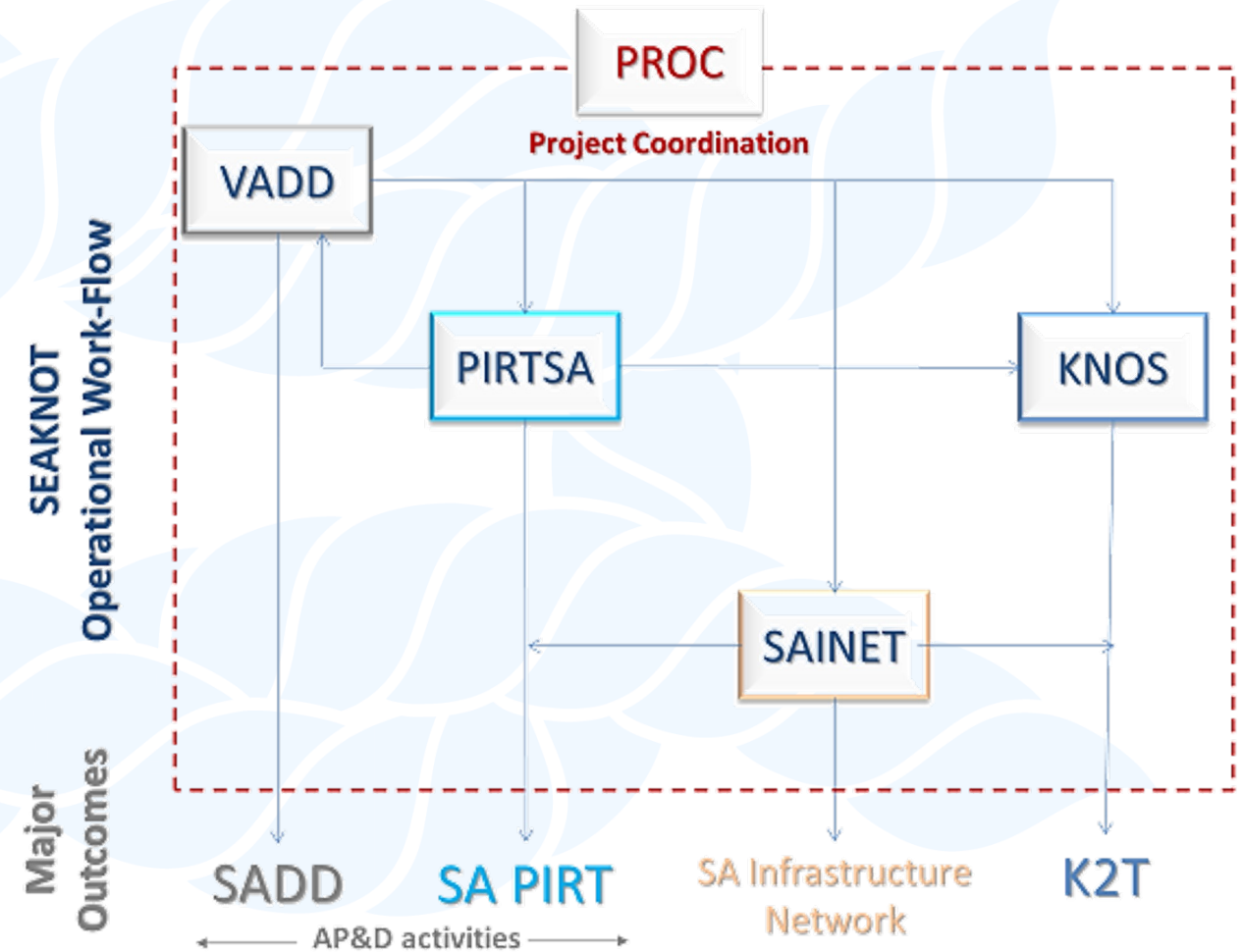
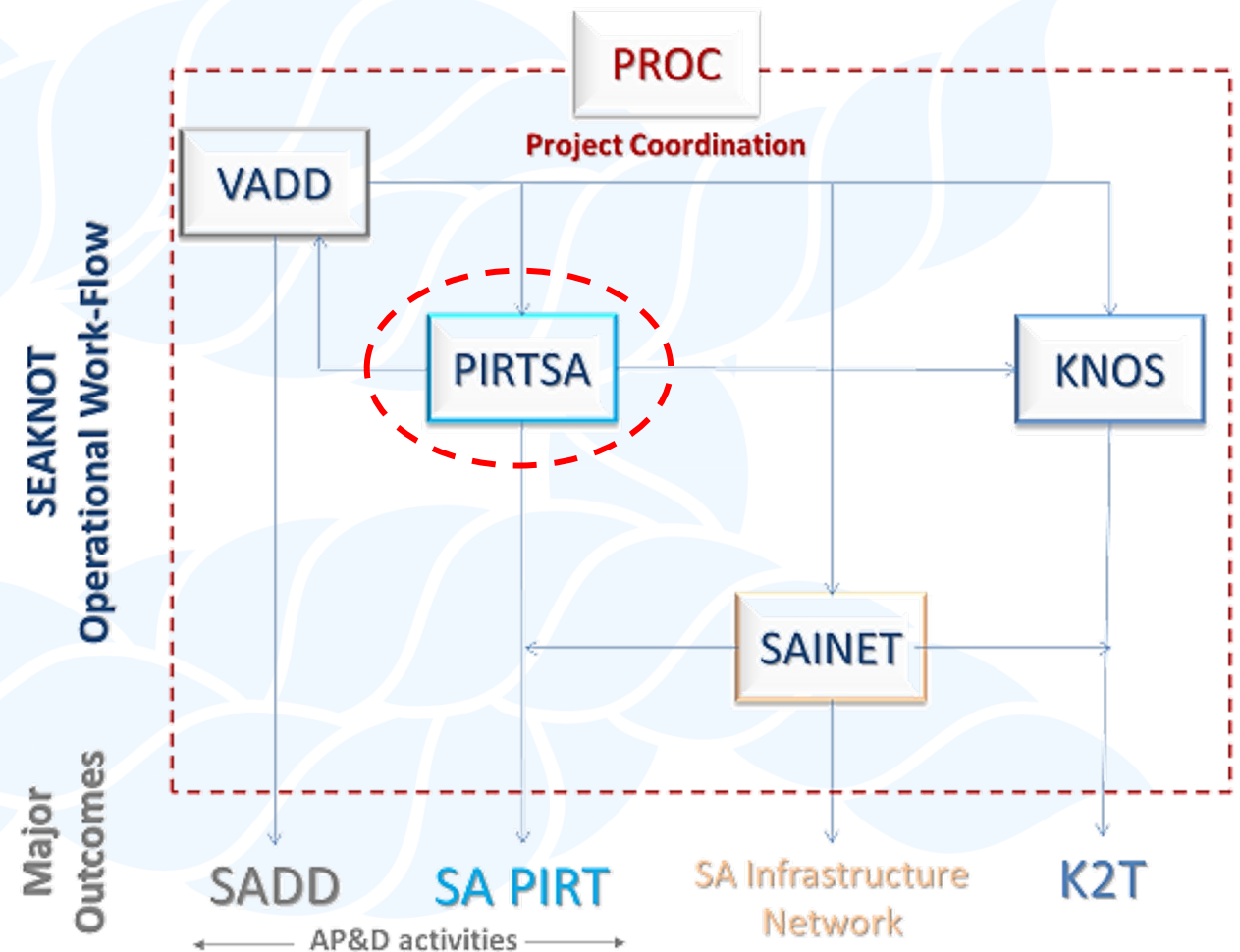**Funded by the European Union**

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Project Structure

PIRTSA is at heart of SEAKNOT and provides input to the other WPs and requires information from **VADD**

VADD also provides relevant information to SAINET, as these two WPs are closely related

The three WPs feed **KNOS** and their input will be used in SAP courses, ERMSAR conferences, SA textbook or in developing the mobility action plan

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WP1 PIRTSA Objective

Identify the major SA issues worth new R&D activities

- Developed by a critical assessment of existing SA knowledge
- Assess the knowledge gaps (data & models)
- Evaluate the safety significance

Bases

- AEAJ PIRT on Source Term (Fukushima based)
- High-level American PIRT (SBO-based)
- From EURSAFE PIRT to SARP
- PIRT on SFP accidents (CSNI/WGAMA)
- running projects under several frameworks…

> PIRT focus on LWRs but including SMLWRs and ATFs related aspects
> - In-Vessel
> - Ex-Vessel
> - Containment
> - Source Term

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WP2 VADD Objectives

Review of SA experimental data used to develop and validate codes presently used to model SAs and support SAMGs

- Critical analyses of database (incl. OECD, EU reports, etc.)

Creation of a SA Database Directory (SADD)

- SADD will be a website analytical tool

- Future share outside the project also using external Knowledge Transfer Platforms, i.e., SNETP, IAEA or NEA

- Target: future expansions to accommodate new experimental data sources

VADD focus on LWRs but including SMLWRs and ATFs related aspects

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WP3 SAINET Objectives

Assessment of EU experimental SA Facilities activities 2022-2030

- Mapping of EU experimental facilities in operation
- Identification of EU experimental able to answer to experimental key needs
- Identify forthcoming needs

Creation of SAINET (Severe Accident Infrastructure NETwork)

- Outline means, recommendations and framework for the future research

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WP4 KNOS Objectives

- **Strengthen EU leadership on SA E&T**

- **Efficiently foster C&D activities of the whole project**
  - Two consolidated NUGENIA TA2 events:
    - **Severe Accident Phenomenology (SAP) Course**
    - **European Review Meeting on Severe Accident Research** (ERMSAR)
  - New edition of SARNET **SA Textbook**, with substantial additions from EU expertise and WP1 - WP3 activities
  - **Internal mobility program** for young researchers & students

- **Articulate means to update SA R&D agenda according to SEAKNOT outcomes**

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WP5 PROC

- **Main objective**: to carry out an effective technical, scientific, legal, financial and administrative **coordination**, by establishing the mechanisms and management procedures

- WP5 takes care of internal coordination among the WPs and

- External coordination with EC and with supporting project bodies, such as Advisory Board (AB) and End Users Group (EUG)
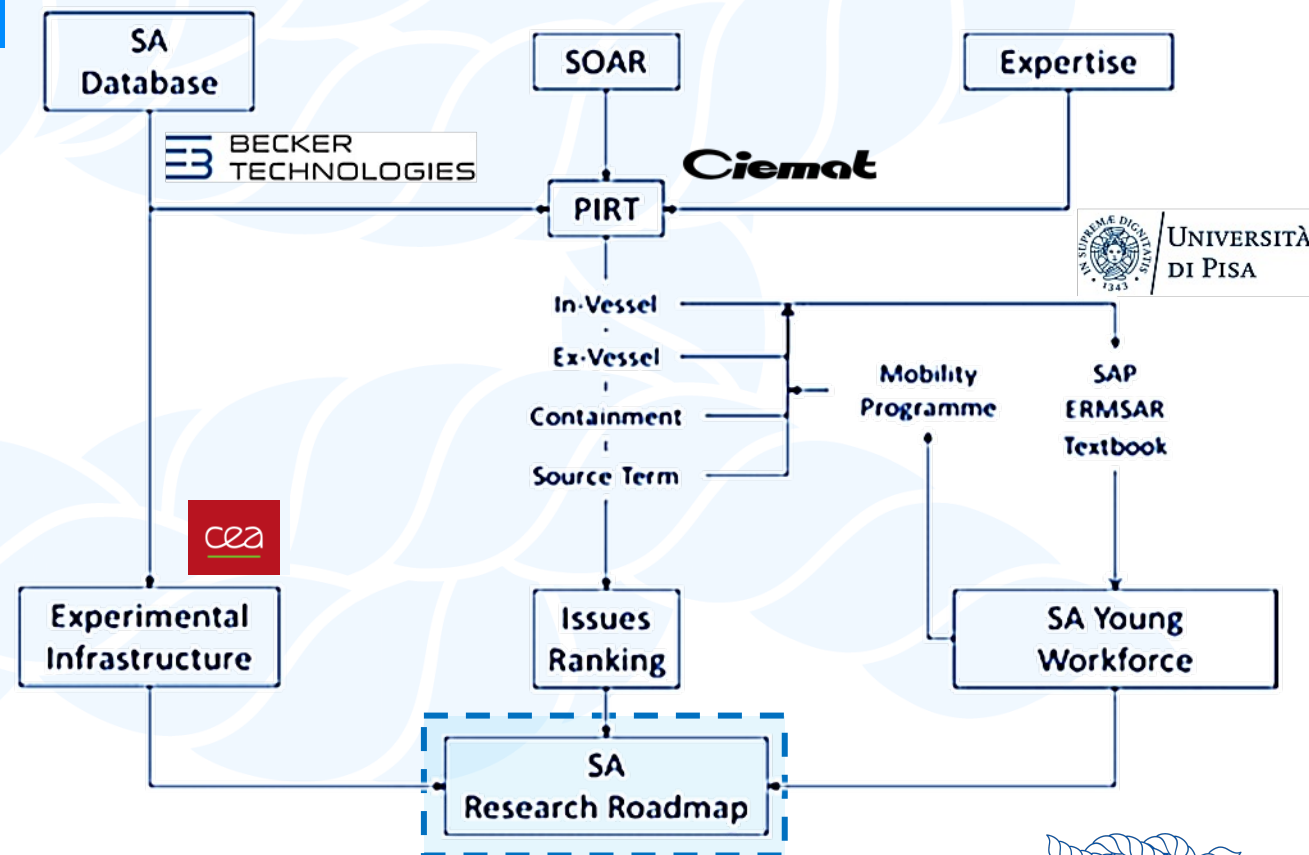
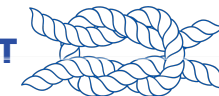SEAKNOT

SEAKNOT Major Outcomes

- **Roadmap for SA research over the next decade**

- SA Phenomena Identification Ranking Table (SA PIRT)

- Validation SA Database Directory (SADD)

- Experimental infrastructure network (SAINET)

- Strengthening of young work-force (SA Textbook, SAP Course, ERMSAR, mobility grants…)

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Project Partners

- **CIEMAT**, IRSN, KIT, JSI, UPM, FZJ, UJV, TRACTEBEL, FRAMATOME, KTH, VTT, ENEA, **CEA**, **UNIPI**, **BT**, LGI, PSI

- SEAKNOT consortium includes organizations from the research sphere, but also from industry, academia, TSOs and energy agencies

- Expertise complemented with **AB** and **EUG**, the former mainly standing on regulation and the latter on international agencies
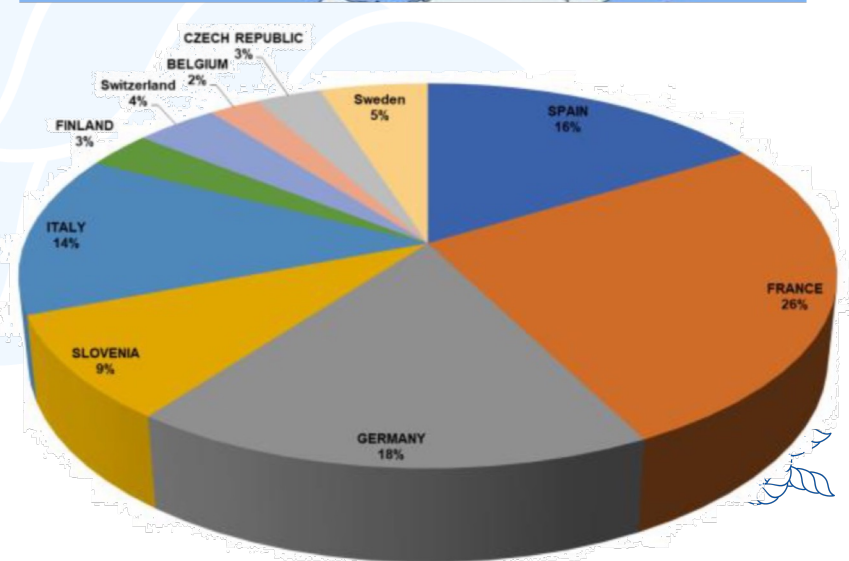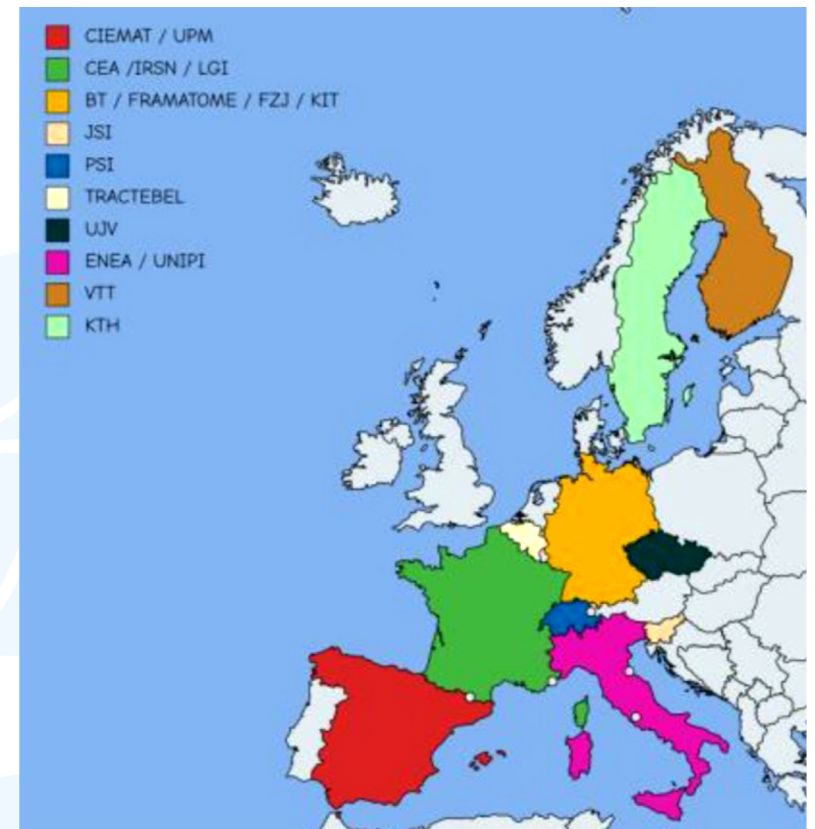
Project Info

Duration and Budget

- October 2022 to September 2026 (4 years)
- Budget € 2,726,993.75

Technical Project Leader

- Prof. Luis E. Herranz

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Project Structure
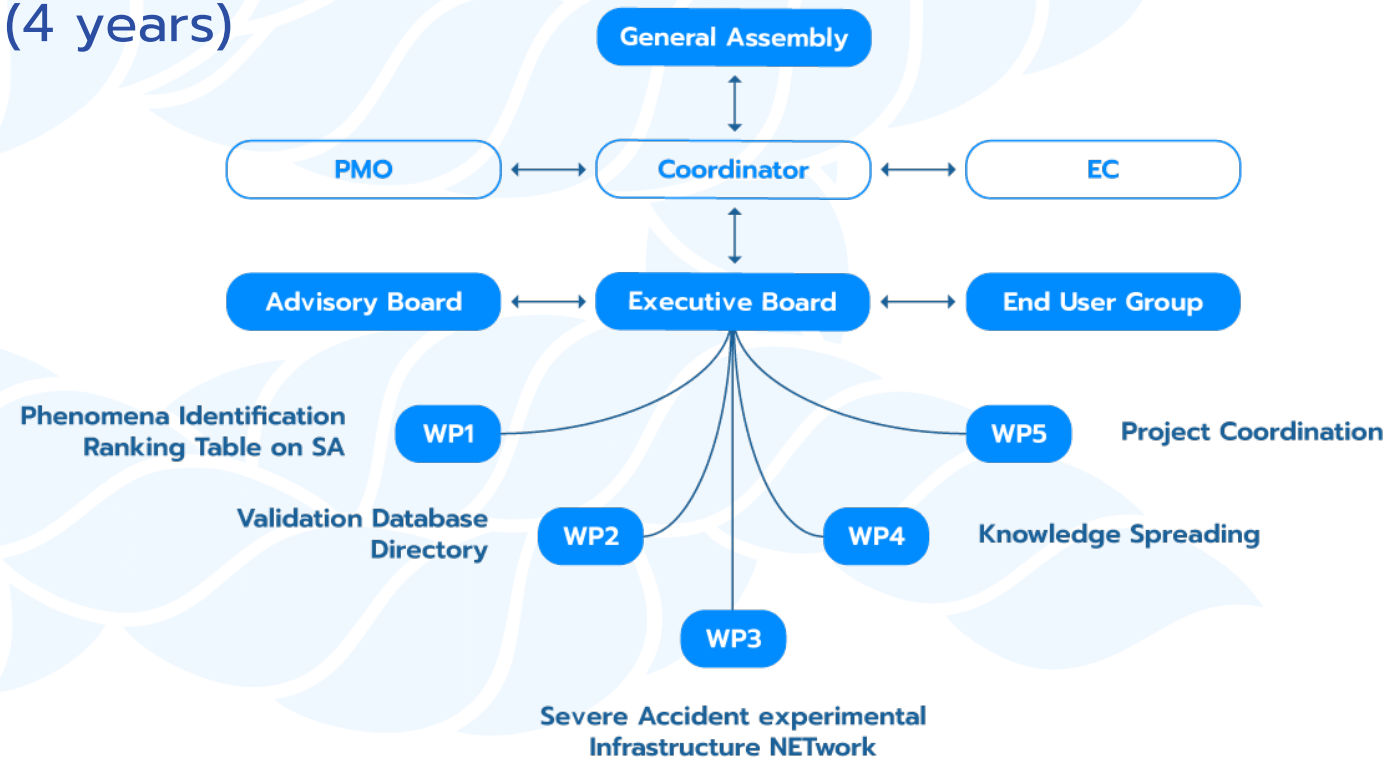
General Assembly

PMO ⟷ Coordinator ⟷ EC

Advisory Board ⟷ Executive Board ⟷ End User Group

Phenomena Identification Ranking Table on SA — WP1

WP5 — Project Coordination

Validation Database Directory — WP2

WP4 — Knowledge Spreading

WP3

Severe Accident experimental Infrastructure NETwork

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Main Events

- **Severe Accident Phenomenology Course**
  two editions in June 2023 (UPM Madrid) and 2025 (FZJ Jülich)

- **European Review Meeting on Severe Accident Research (ERMSAR Conference)**
  two editions in May 2024 (KTH Stockholm) and 2026 (CIEMAT Madrid)

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Severe Accident Phenomenology short course - SAP 2023

Universidad Politécnica de Madrid
19 - 23 June 2023

POLITÉCNICA / INDUSTRIALES ETSII | UPM

The 2023 edition of the Short Course on Severe Accident Phenomenology
will take place from Monday 19 to Friday 23 June 2023
at Escuela Técnica Superior de Ingenieros Industriales, Universidad Politécnica de Madrid

It will be jointly co-organized by UPM Universidad Politécnica de Madrid, CEA Cadarache (F), CIEMAT Madrid and University of Pisa (I) in the framework of the **SEAKNOT** Euratom project on "*Severe accident research and knowledge management for LWRs*".

The SAP short course is focused on the knowledge gained on Severe Accident in the last two decades to M.Sc.-Ph.D. students, young engineers and researchers recently involved in severe accidents.

This SAP 2023 edition is a sequel to the previous NUGENIA TA2 SAP Courses held in Bologna (2021), Cadarache 2019 and Ljubljana 2017. In this edition, updated and extended contents will be presented, for the first time, face-to-face.

As in the specific objectives of the **SEAKNOT** project, reputed scientists and engineers will be requested to go beyond what's written in books, papers and reports to transfer their knowledge and expertise, gained when dealing with respective subjects in the professional careers, to young generation of students and researchers in the Severe Accident field.

More information on **SAP 2023** will be soon available on the **SEAKNOT** and **NUGENIA TA2** webpages

https://snetp.eu/technical-area-2-severe-accidents/

SNETP Sustainable Nuclear Energy Technology Platform

NUGENIA TA2 Nuclear Generation II&III Alliance

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ERMSAR 2024
11th European Review Meeting on Severe Accident Research

BOOK THE DATE!

May 13-16, 2024
Royal Institute of Technology (KTH), Sweden

KTH VETENSKAP OCH KONST

The 11th European Review Meeting on Severe Accident Research **ERMSAR 2024** Conference will be organised by KTH Stockholm in the frames of the **SEAKNOT EU project and SNETP/NUGENIA Technical Area 2.**

This open and field-specific conference will have a focus on the latest progress of international knowledge on severe accidents in nuclear plants. As in the last edition, the scope of the conference includes also innovative nuclear technologies, such as Accident Tolerant Fuels (ATFs), Small Modular Reactors (SMRs), fusion, etc.

ERMSAR 2024 will pay particular attention to technical discussions and will ensure enough time and the best atmosphere to turn the event in a true opportunity for students, researchers and engineers' exchanges. The Conference will display the major progress recently accomplished in the field and will look ahead to highlight what should be in the near-term research agenda.

More information on the ERMSAR 2024 will be soon available on the conference website and on SEAKNOT and NUGENIA TA2 webpages
http://www.seaknot-project.eu/defaultsite
https://snetp.eu/technical-area-2-severe-accidents/

SNETP Sustainable Nuclear Energy Technology Platform

NUGENIA TA2 Nuclear Generation II&III Alliance

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THANK YOU!
Get in touch for more information

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All of the reports of the project will be available for download on the SEAKNOT website: **www.seaknot-project.eu**

Project coordinator: Luis Enrique Herranz, CIEMAT
Contact us: **contact@seaknot-project.eu**

Follow us on LinkedIn!
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