# MOBILITY MISSION REPORT

*This work has been partially supported by the EURAD project that has received funding from H2020-EURATOM 1.2 under grant agreement ID 847593.*

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## REPORT TEMPLATE GUIDELINES — REMOVE THIS ENTIRE SECTION BEFORE SUBMITTING

- *This template consists of "sections" (fixed headings) and "fields" (text boxes for custom information)*
- *All sections and fields are mandatory unless specified otherwise*
- *Appendix "A. Mission journal" should be prepared during the course of the mission*
- *All template guidelines shall be replaced with custom text or removed as specified*
- *The report shall be approved by the official mission mentors or supervisors before submission (use the signature block at the very end of the report template)*
- *The report shall be submitted in both editable (.doc) and portable (.pdf) file formats*
- *Both files shall use the code of the mission as the filename's suffix, i.e. "Mission_Report_SXXXXX" : the word "Template" shall be replaced with the initial code assigned automatically to the application (letter "S" followed by 5 digits)*
- *The report shall be submitted via email to euradwp13@sckcen.be*

## MISSION TITLE

Participation to ICEM 2023

## DESCRIPTION

### Concerned organisations

Remove this entire field as well as every below organisation that do not apply and add lines to specify other relevant organisations as appropriate

- Research entities
- Technical support organisations

- Waste management organisations

## Concerned infrastructures or facilities

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## Concerned phases

Remove this entire field as well as every below phase that do not apply

- Phase 0: Policy, framework and programme establishment
- Phase 4: Facility operation and closure
- Phase 5: Post-closure

## Themes and topics

- Theme 1: Managing implementation and oversight of a radioactive waste management programme
  - Programme planning
  - Organisation
  - Resources
- Theme 2: Radioactive waste characterisation, processing and storage (Pre-disposal activities), and source term understanding for disposal
  - Waste handling, characterisation, treatment and packaging
  - Interim storage
  - Transportation between facilities
  - Radionuclide inventory and source term
  - Waste acceptance criteria
- Theme 3: Engineered barrier system (EBS) properties, function and long-term performance
  - Spent Fuel and high-level waste disposal canisters
  - Containers for long-lived intermediate and low level wastes
  - Clay-based backfills, plugs and seals
  - Cementitious-based backfills, plugs and seals
  - Salt backfills
  - EBS system understanding
- Theme 5: Geological disposal facility design and the practicalities of construction, operations and closure
  - Facility and disposal system design
  - Constructability, demonstration and verification testing
  - Health and safety during transport, construction, operations and closure
  - Monitoring and retrievability
- Theme 7: Performance assessment, safety case development, and safety analyses
  - Integration of safety-related information
  - Performance assessment and system models
  - Treatment of uncertainties

## Keywords

Decommissioning, general policies, NORM, radioactive waste management

## EXECUTIVE SUMMARY

The proposed mobility action involved attending the ICEM 2023 internatial conference on Environmental remediation and radioactive waste management which was held in Stuttgart, Germany. The main objective was to present a joint paper of PREDIS and EURAD on digitization and digital twins in long-term management of radioactive waste. The conference was a little bit disappointing as the number of participants was rather low with a significant number of parallel sessions. Plenary sessions gave a holistic overview of a number topics with high relevance for the road map in PREDIS and EURAD (e.g., Finland's approach to final disposal of spent fuel and the path towars the world's first deep geological repository, spent fuel management in VS). Specific sessions were given on EURATOM projects, geological repositories and performance, and cement based materials. An interesting presentation was also the overview of integrated research to spent fuel ranging from characterisation, behaviour during storage and disposal research by Saltzstein (SNL). Note that there were also some presentations from PREDIS.

Overall, this conference has a large potential and is interesting in the framework of EURAD and PREDIS. Two potentially strong points are (i) the broad range of topics (decommissioning, predisposal and disposal activities, NORM waste) and the holistic views related to it, and (ii) an international forum for the exchange of scientific and practical information on management of radioactive waste including waste disposal with different partners experts from academy/research, industry and government on different aspects in the back-end of the nuclear fuel cycle However, the current edition did not fulfill completely these potentials, especially for the second point.

# 1. MISSION BACKGROUND

## 1.1. R&D background

The ICEM conference 2023 (International conference on environmental remediation and radioactive waste management, October 3-6 2023, Stuttgart) providse an international forum for the exchange of scientific and practical information on management of radioactive waste including waste disposal. The interesting part that is it brings together experts from academy/research, industry and government on different topics in the back-end of the nuclear fuel cycle.

## 1.2. Mission objectives

To present examples form EURAD and PREDIS regarding digitalization and digital twins in long term management of radioactive waste.
The proceeding paper/presentation is a result of the activities related to digital twins in EURAD (and recently in the grant budget extension for ACED/DONUT on digital twins - we organize discussion sessions between many partners from RE, WMO and TSO between different work packages, with the involvement of PREDIS partners as well).

## 1.3. Mission request

Attending the ICEM conference 2023.

## 1.4. Mission composition

### Host organisation

American Society of Mechanical Engineers

### Host facility

International Conference Centre Stuttgart, Stuttgart, Germany

### Mission dates

03 October 2023 – 06 October 2023

# 2. MAJOR PRACTICES, TECHNIQUES, METHODS, TOOLS OR SYSTEMS OPERATED OR STUDIED

Not relevant

## 2.1. Practice, technique, method, tool or system operated or studied during the mission

Not relevant

### Description

Not relevant

### Usage

Not relevant

### Benefits

Not relevant

### Limitations

Not relevant

### Applicability

Not relevant

## 2.2. Practice, technique, method, tool or system operated or studied during the mission

Not relevant

### Description

Not relevant

### Usage

Not relevant

### Benefits

Not relevant

### Limitations

Not relevant

### Applicability

Not relevant

## 2.3. Practice, technique, method, tool or system operated or studied during the mission

Not relevant

### Description

Not relevant

### Usage

Not relevant

### Benefits

Not relevant

### Limitations

Not relevant

### Applicability

Not relevant

## 2.4. Practice, technique, method, tool or system operated or studied during the mission

Not relevant

### Description

Not relevant

### Usage

Not relevant

### Benefits

Not relevant

## Limitations

Not relevant

## Applicability

Not relevant

# 3. MISSION FINDINGS AND CONCLUSIONS

## 3.1. Lessons learned and conclusions

See executive summary

## 3.2. Relevant findings and conclusions for home organisation

## 3.3. Relevant findings and conclusions for host organisation

## 3.4. Relevant findings and conclusions for other organisations

# 4. POTENTIALS FOR IMPROVEMENT OR DEVELOPMENT

## 4.1. Generic potentials

## 4.2. Potentials for home organisation

## 4.3. Potentials for host organisation

# APPENDICES

## Mission journal

This section is mandatory.

04 October 2023

Participation to plenary sessions during ICEM 2023

Participation to selected break-out sessions duing ICEM 2023

05 October 2023

Participation to plenary sessions during ICEM 2023

Participation to selected break-out sessions duing ICEM 2023

06 October 2023

Participation to plenary sessions during ICEM 2023

Participation to selected break-out sessions duing ICEM 2023

## Mission bibliography

# MISSION BENEFICIARY

Diederik JACQUES
Unit head and Scientific project leader
Engineered and Geosystem Analysis Unit
Belgian Nuclear Research Center, SCK CEN, Belgium

# PARTNER EXPERTS CONTRIBUTING TO THE MISSION

## Host organisation experts

- 

## Home organisation experts

- Klikněte nebo klepněte sem a zadejte text.

## Other organisations experts

Klikněte nebo klepněte sem a zadejte text.

# REPORT APPROVAL

| Date | Beneficiary | Home mentor/supervisor | Host mentor/supervisor |
|---|---|---|---|
| Date of last signee | Diederik Jacques | Elie Valcke | Name |
| | Visa: Diederik Jacques Digitally signed by Diederik Jacques Date: 2023.11.14 16:54:23 +01'00' | Visa: Elie Valcke (Signature) Digitally signed by Elie Valcke (Signature) Date: 2023.11.08 09:01:11 +01'00' | Visa |