

ERDO Association Annual Report 2021

Contents

Introduction.....	2
Organization	2
Board and secretariat	2
Members	2
Meetings.....	2
ERDO webinar.....	2
ERDO projects.....	2
Legacy waste characterization (LWC).....	3
Deep borehole disposal (DBD)	3
Collaboration with other organizations	3
EURAD	3
IGD-TP.....	4
Collaboration with European HORIZON 2020 projects	4
Papers and presentations.....	4



ERDO Association Annual Report 2021

Introduction

The ERDO Association was established on January 7 in Vlissingen, the Netherlands, by Dekom (Denmark), NND (Norway) and COVRA (Netherlands). The new Association will continue the work of the ERDO Working Group which was created in 2009, following the preparatory work based on the outcome of the SAPIERR projects, organised by the Arius Association and funded by the European Commission.

The ERDO Association was founded to allow organizations to work more closely together on the common challenges in managing radioactive waste safely by sharing knowledge, implementing joint projects and promoting multinational waste management solutions internationally.

Organization

Board and secretariat

The founding Board members were: Ewoud Verhoef (COVRA, President), Ole Kastbjerg Nielsen (Dekom, Vice President) and Håvard Kristiansen (NND, Treasurer).

The association Secretariat is located in the COVRA offices in Nieuwdorp and its work was performed principally by Marja Vuorio (COVRA) who is also responsible for maintaining the new ERDO website (www.ERDO.org). Charles McCombie and Neil Chapman from the Arius Association assisted the Secretariat and acted as advisers to ERDO, taking part in various activities. The Arius Association produces a separate annual report of their work.

Members

Other organizations from the ERDO working group joined the Association during 2021. They were also involved in the preparatory work to establish ERDO: ARAO (Slovenia), ENEA (Italy), Fond-NEK (Croatia) and the Ministry of Climate and Environment (Poland).

Meetings

Five meetings were organized during 2021; all were arranged through Webex due to COVID travel restrictions.

Minutes were sent to participants after the meetings and digital versions are saved in COVRA's documentation system.

ERDO webinar

On September 16th, ERDO organized a public webinar at which ERDO members explained why ERDO membership is important to them. The history of ERDO development was summarized, ERDO's road map for future activities was presented and participants were able to send their questions about shared solutions for a panel to discuss. Materials from the webinar are available on the ERDO webpage¹.

ERDO projects

ERDO-Working Group started two projects in 2020 and they continued under the ERDO Association.

¹ <https://www.erdo.org/meetings/>

Legacy waste characterization (LWC)

Nuclear activities performed in the past, not only in the power generation field but also in medicine, research and industry, have generated significant quantities of radioactive waste, which have been treated and conditioned according to the rules in force at the time or simply stored pending a suitable management solution. These waste (conventionally called 'Legacy Waste' or 'Historic Waste' in some countries) are often lacking sufficient physico-chemical-radiological characterization data for envisaging possible re-treatment/re-conditioning processes in line with current regulatory requirements and/or checking compliance with Waste Acceptance Criteria (WAC) of storage/disposal facilities.

Through this project ERDO expects to:

- Gain better knowledge of the current situation of the main Legacy Waste streams in the participating countries and share of common issues
- Find a streamlined path for possible future management and acceptance of Legacy Waste packages for storage or disposal in national/multi-national facilities
- Provide early indications to producers for treatment and conditioning of waste generated in countries without a well-established disposal route and relevant WACs.

The first report on Legacy Waste streams of the participating countries is available on the ERDO webpage.²

Deep borehole disposal (DBD)

The DBD project assesses the strategic potential of deep borehole disposal for several European countries, based on their existing and projected national waste inventories. The project has identified a basic design that could enable disposal of both spent fuel and high-level waste from reprocessing, thereby enabling disposal of a significant portion of the combined waste inventory. Strategic implications, such as the support facilities required, implementation time, risks and costs have been assessed. The generic process for concept development has been described. The concept is in an early, generic stage. Central uncertainties have been assessed, and topics for continued research and development have been identified.

The project is based on development work done by NND for the Norwegian waste inventory and extrapolated to the inventories of other ERDO members. Several technical reports describing DBD are available on NND's website³. NND also commissioned Deep Isolation Inc to conduct a study dedicated to the ERDO DBD-project, the final report of which is also available on NND's website⁴.

Collaboration with other organizations

EURAD

ERDO Members are involved in different Work Packages under the European Commission's EURAD Program, and especially the ROUTES WP Task 6 on shared solutions in radioactive waste management, which is relevant from an ERDO Association perspective. In addition, Dekom represented Small Inventory Member States in the Bureau until the end of 2021, when this role was transferred to SURAO (Czech Republic). It has been agreed to maintain contact between SURAO and the ERDO Association to ensure that the ERDO Association receives the relevant information about the program.

EURAD Knowledge WP 13 invited ERDO to their *Lunch and Learn* session on May 26, where Ewoud Verhoef, president of ERDO, gave the presentation.

² <https://www.erdo.org/app/uploads/2022/02/DN-SM-00117-LWC-Survey-Task1-Final-Report.pdf>

³ <https://www.norskdekkommisjonering.no/om-nnd/publikasjoner/tekniske-rapporter/>

⁴ https://www.norskdekkommisjonering.no/wp-content/uploads/2021/12/Preliminary-assessment_Deep-Isolation-borehole-repository-as-a-disposal-option-for-nuclear-waste-in-the-ERDO-countries.pdf

Also, the EURAD work package, ROUTES, collaborated with ERDO on WACs. Subtask 4.2 of ROUTES invited ERDO members to participate in the Workshop “*Sharing experiences on waste management with/without WAC*” on June 14-15th. The results of this WS will be included in the ROUTES Deliverable 9.9.

IGD-TP

As a member of Executive Group (EG) of IGD-TP, COVRA kept the EG up to date on ERDO’s interests and activities and provided information on IGD-TP’s activities to ERDO members. ERDO also joined the IGD-TP as a member in 2021.

Collaboration with European HORIZON 2020 projects

During 2021, ERDO members were invited to share information or participate in webinars, workshops and meetings with some EC funded projects, as summarized below.

MICADO and ERDO LWC-project held an information exchange meeting on March 31st, since both projects handle methodologies on characterization of waste. Project overviews were given and overlapping topics discussed.

PREDIS organized several webinars during the year, which were available for all interested parties. For two webinars about WAC, ERDO members were also invited to plan and organize the events and present their results. From both webinars, as for all PREDIS webinars, the materials are available on the PREDIS webpage:

- April 21st first WAC seminar: Information and Resources presentations⁵, summary of the webinar⁶ and recording⁷.
- May 20th second WAC seminar on needs, challenges and opportunities: presentations⁸, summary of the webinar⁹ and recording¹⁰.

Papers and presentations

An article about ERDO was published in ATW - International Journal for Nuclear Power 04/2021¹¹.

The IAEA hosted *the International Conference on Radioactive Waste: solutions for a sustainable future* in Vienna on 1-5 November. The DBD-project was presented as a poster, with the following abstract.

"Deep borehole disposal has received increased attention in recent years as a potential method for safe disposal of high-level radioactive waste, including spent nuclear fuel. Borehole disposal is of particular interest to small-inventory states, because the economies of scale are different than for deep geological repositories that involve access tunnels, shafts, and tunnel galleries (mined repositories). The driver for countries to combine their waste inventories in a shared multinational repository (MNR) is thus not as strong for borehole repositories, but large benefits can still result from multinational cooperation. The ERDO Association is conducting a project that assesses the strategic potential of borehole disposal for several European countries, based on their existing and projected national waste inventories. The project has identified a basic design that could enable disposal of both spent fuel and high-level waste from reprocessing, thereby enabling disposal

⁵ <https://predis-h2020.eu/wac1-webinar-21-4-2021/>

⁶ https://predis-h2020.eu/wp-content/uploads/2021/06/Predis_WAC1_Webinar_Summary_14-6-2021.pdf

⁷ <https://www.youtube.com/watch?v=a224GDJBN4A>

⁸ <https://predis-h2020.eu/wac2-webinar-20-5-2021/>

⁹ https://predis-h2020.eu/wp-content/uploads/2021/06/Predis_WAC2_Webinar_Summary_14-6-2021.pdf

¹⁰ https://www.youtube.com/watch?v=H70Y_XElaI

¹¹ <https://www.yumpu.com/en/document/read/65745161/atw-international-journal-for-nuclear-power-042021>

of a significant portion of the collective waste inventory. Strategic implications, such as required support facilities, implementation time, risks, and costs have been assessed. The generic process for concept development has been described. The concept is in an early, generic stage. Central uncertainties have been assessed, and topics for continued research and development have been identified. The differences between fixed and variable costs for borehole disposal and mined repositories may enable a multinational approach that focuses on sharing R&D-resources, encapsulation facilities, tools, and methods, rather than constructing one shared repository. This may open attractive opportunities for national and international organizations, as well as commercial companies with relevant competence.”