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BREAKING NEWS

Join us for EURAD 3rd annual event at Golden Bay Beach Hotel in Larnaca (Cyprus) – 14 to 16 March 2023.



The added value of joint programming and its impact on the national programmes

| Day 1 – Tuesday 14 th March | |
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| Morning (08.30-12.30) | Strategic Sessions and Panel Session – The benefits of joint programming |
| Afternoon (14.00-17.00) | Cross-linkage of PhD work throughout the R&D WP – Open to all |
| Evening | Social dinner |

| Day 2 – Wednesday 15 th March | |
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| Morning (09.00-13.00) | Parallel breakout sessions – Cross-cutting work in EURAD |
| Afternoon (14.30-18.30) | Parallel topical sessions – Technical results / individual WPs |

| Day 3 – Thursday 16 th March | |
|---|--|
| Morning (08.30-12.40) | Topical session – Technical results / WPs |
| Afternoon (14.10-16.00) | Spotlight on cutting-edge science Concluding session of the breakout Closing remarks |

This event will take place exclusively in-person. Information on accommodation and travel will be provided when registration opens (expected end of 2022 / early 2023)

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INTERVIEW WITH DANIELA DIACONU (UMAN WP LEADER)

How is UMAN, as a Strategic Study, contributing to EURAD step change in European collaboration in RWM?

We are used with the research projects which bring constantly new evidences improving our knowledge, looking in depth to different aspects of waste management and disposal, but strategic studies are something new in the R&D programme on Radioactive Waste Management. UMAN is looking to all aspects of the complex process of uncertainties management, through the eyes of researchers (REs), implementers (WMOs), regulatory advisers (TSOs) and civil society (CS) representatives, with the aim to integrate their views in a common opinion on the significance for safety and risk of different uncertainties and on their management. To reach this objective, UMAN connects "technical" actors and civil society representatives, existing and new generated knowledge, topical areas ranging from wastes inventory to human aspects. All these are possible only due to the EURAD nature which gathers everything under the same roof.

Within UMAN, experience acquired and relevant for the uncertainty management was collected, discussed and integrated in comprehensive and integrative concepts, shared by all stakeholders, including civil society. Therefore, uncertainty classification scheme, uncertainty management approach and management options of the most safety-significant uncertainties, developed by UMAN, are already available. They could be used by any actor involved in RWM, in any stage of the disposal programme, in planning and implementing the uncertainty management programme, as well as in taking appropriate decisions to reduce or avoid existing uncertainties, or mitigate their impact on disposal safety.

CS involvement in UMAN, discussing the technical aspects of the uncertainty associated with disposal safety "translated" into a more accessible language and also including the human aspects in the discussion showed transparency from the "technical" actors and contributed to a better understanding of these elements, as well as, I hope, to an increase in the confidence of the CS representatives. On the other side, the Civil Society opinions revealed new aspects and different



priorities in their concerns and perceptions regarding the uncertainties and disposal safety or risk, which should be considered in the future EURAD activities.

One of UMAN goal is to develop a common understanding between the three Colleges and Civil Society, therefore you have quite a number of interactions with other work packages as well as with Civil Society. How are you managing them?

Indeed, reaching a common understanding on the uncertainty management is the central objective of the UMAN and up to now I believe we have been quite successful! First of all, we have developed inside UMAN interactions among representatives of the three Colleges (WMOs, TSOs and REs) and Civil Society as part of the Exert Groups, workshops and seminars which allowed collecting, discussing and integrating a large diversity of views reflecting particularities of the national programmes, institutional or individual experience and knowledge.

Secondly, questionnaires (maybe too many and too long) have been addressed to all EURAD members, in order to capture, as much as possible, the diversity of views of the whole EURAD community. All these were supplemented by contributions received from the other EURAD WPs, either through SotA reports, or as part of their participation in UMAN workshops and seminars, or in various EURAD events (such as the UMAN-CORII-CS pluralistic dialogue). The broad scope of UMAN, covering waste inventory, spent nuclear fuel, near field, site and geosphere and human aspects, links it with many EURAD WPs such as ROUTES, FUTURE, CORI, SFC, HITEC, DONUTS, MODATS

We also went outside EURAD, establishing interactions with the IAEA and NEA, through exchanges with the LABONET network on waste characterization and the International Group on Safety Case and Forum of Stakeholder Confidence, inviting them in the UMAN workshops and seminars, or attending their events.

Can you give us some intermediate results on the type of uncertainties you identified and how it could be managed in the safety case?

We distinguished five main types of uncertainties:

- Programme uncertainties, associated with the RWM programme and other prevailing circumstances (societal, resources, etc.);
- Uncertainties associated with the initial characteristics of the disposal system and its environment;
- Uncertainties associated with the evolution of the disposal system and its environment, which include effects of events and processes that may affect the initial characteristics (e.g. uncertainties associated with the migration of radiotoxic and chemotoxic elements) as well as human influence or intrusion;
- Uncertainties related to concepts (models) and parameters (data) used in the safety assessment;
- Uncertainties associated with the completeness of the safety assessment (uncertainty in overlooking certain aspects relevant for safety).

We all know that safety strategies are based on an iterative approach, a regular dialogue with stakeholders and a safety-oriented management process, which include approaches for uncertainties management. Uncertainty management also requires an iterative approach, correlated with the progress of the disposal program, which must necessarily include an iterative approach to research and data acquisition activities aimed at reducing or avoiding existing uncertainties or mitigating their effect. Integrating the views of all actors involved in UMAN work, we came up with identifying steps. All these steps are framed and depend on the state of knowledge, size of the RWM programme, national policies, regulations, stakeholders, resources, which all together represent the prevailing circumstances in the uncertainty management strategy.

Each step of the uncertainty management strategy is updated progressively and iteratively as the

disposal programme and its prevailing circumstances progress. For example, the identification, characterisation and analysis of uncertainties is an ongoing process that needs to consider the new identified and emerging uncertainties. The assessment of uncertainties impact on disposal safety is iterated as new information on safety-relevant uncertainties is acquired as result of activities such R&D, further data acquisition, site selection and site characterisation, adapting the disposal concept, adopting particular construction methods, adapting the limits, controls, as well as interacting with the stakeholders.

You became UMAN WP leader at the beginning of the year, how are you experiencing this role?

Indeed, I took over the coordination of the UMAN WP in February 2022, two and a half years after its inception, when it already had its own identity and a clear approach to its implementation. Also, important elements of uncertainty management (such as the classification scheme, the uncertainty management approach and potential options) were already being developed and widely agreed upon by the three colleges under the leadership of Frank Lemy.

As a UMAN Task leader and member of the Management Board, I knew its implementation stage quite well, and even more importantly, I knew the UMAN team and that I could count on their continued input and support to successfully complete our work.

So, I try to continue the work left from the 1st wave and implement the contracted activities in the 2nd wave, convey our recommendations for updating the SRA and disseminate our results as widely as possible, and keep the interactions with the other WPs active.

I would like that in the next EURAD program, all the UMAN results are capitalized by integrating them into an interactive tool that can be used to guide any RWM stakeholder in uncertainty management.



SAFETY CASE TRAINING COURSE

WP13 in cooperation with NEA, IGD-TP and SITEX.Network are organizing a EURAD Training Course on Safety Case Development and Review.

This course will be held from **November 28 until December 2, 2022 in Prague.**

Practical details

- Subtype: classroom-based training (face-to-face)
- Language: English
- Target audience: national regulators, technical support organisations, waste management organisations, professionals/experts involved in the safety case development and/or review, civil society experts, researchers involved in the RWM, participants involved in cooperating projects
- Educational level: EQF Level 6: equivalent to (Academic) Bachelor degree
- **Registration deadline : 10 November 2022**
- Venue : National Radiation Protection Institute (SURO) – Prague, Czech Republic

The preliminary programme and registration can be found on [EURADSchool website](#).



Did you know?

EURAD and EURADSchool website contains a lot of resources:

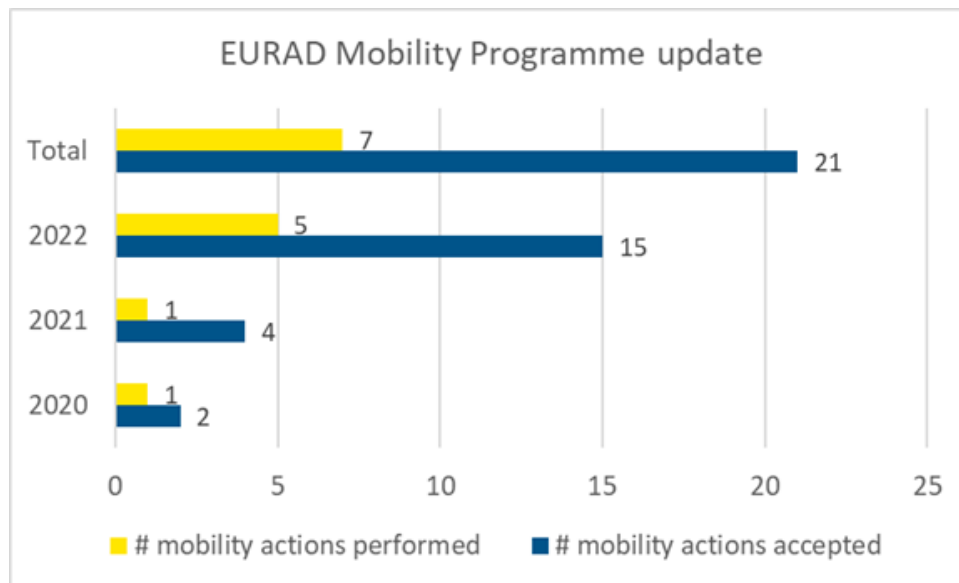
- Recordings of all Lunch-and-learn since the start of EURAD !
- Recordings of EURAD annual event n°2
- Recordings of follow-up session on Evaluating the impacts of EURAD WPs
- 15 min video on Knowledge Management in EURAD

Do not hesitate to check regularly the website and especially the news section and if you don't want to miss any information follow-us on LinkedIn and Twitter.



Mobility Programme – Status update

After two “Covid years”, the EURAD Mobility Programme has gained a lot more attention since the Spring of 2022. The graph below shows the number of applications between the start of the Mobility Programme in April 2020 and the end of September 2022. It clearly shows that the number of applications made in 2022 is greater than that of 2020 and 2021 combined! In total 21 mobility applications were approved, 15 of which in 2022. Of those 21, 7 have been completed so far, 5 of which in 2022. The major contributing factor to this is most likely the lifting of COVID-19-related travel restrictions. However, it is also worth noting that of the 15 applications that were approved in 2022, three applications were aimed at attending a conference or workshop and another three were aimed at attending training courses. This is noteworthy because this only became an option in April 2022 and 5 months later these types of applications account for 40% of the total number of applications.



In addition, the EURAD Mobility Programme is also supporting Ukrainian partners to allow them to continue their work abroad. So far six partners have requested financial support via this mechanism and all six applications were granted (these numbers are not included in the graph). Currently, the Mobility Programme is still open to any Ukrainian partner that still want financial support to be able to work abroad. To apply, please contact Work Package 13 via euradwp13@sckcen.be.

Finally, WP13 would like to remind the EURAD partners that the upcoming application deadline for the Mobility Programme is October 31st, 2022.

Mobility in a nutshell

The Mobility Programme, **open to all**, but primarily focused on junior researchers, financially supports you in:

- Visiting technical installations such as the French URL
- Visiting specific infrastructures such as the British Geological Survey in Nottingham
- Attending conferences in the field of RWM

Visit the [EURADSchool website](#) for more information.



Focus – State-of-Knowledge

Safe RWM requires knowledge about many different topics. The EURAD Knowledge Management Programme is working to capture this knowledge and make it available to you - the end-users.

In this context, two new Domain Insight documents were recently published:

- [Transport of radioactive waste](#) (Domain 2.2.5 of the [Goals Breakdown structure](#))
- [Scenario development and FEP analysis](#) (Domain 7.3.3 of the [Goals Breakdown structure](#))

The production of these Domain Insight documents is led by WP11 State-of-Knowledge in collaboration with the PREDIS project (for documents in Theme 2 – Pre-disposal of the EURAD Goals Breakdown Structure, such as the Domain Insight document on Transport of radioactive waste).

These documents are authored and reviewed by experts, and shall be useful to the end-users. Therefore, we invite you not only to check out these new documents, but also to get involved as experts in EURAD KM or provide your feedback as end-users. For this, you can simply contact the WP11 leader (Alexandru.tatomir@bge.de) or the EURAD secretariat (secretariat@ejp-eurad.eu).



OVERVIEW

Radioactive material transport by land, water or air is a standard procedure worldwide for decades. The practice has well established guidelines to comply with regulations and stakeholder expectations. Distinctions are typically made between domestic and international transport, as well as internal site transport and that which is via public roads. The objective of this overview document is to provide guidance focused on public and international transport issues in the pre-disposal stage of waste management.

About 20 million transport consignments of radioactive material take place annually, though it is estimated that just 5% of radioactive material shipped globally each year relates to nuclear power production. The other 95% is related to transport of radioisotopes for medical and industrial use. In the USA, the US Department of Transportation estimates that the average distance per shipment of radioactive material is about 55 km, which is significantly below the average transport distance of 185 km for all other types of hazardous material. [WNE 2021]

When radioactive materials are transported with respect to nuclear power product and waste management, there are often multiple steps of the transport activities through the fuel cycle process. Transport must consider initial source uranium all the way through waste transport to fuel cycle service and material processing facilities, interim storage facilities and finally towards disposal. Shipment is done by specialised authorised companies, sometimes using purpose-built transport vehicles/ships and containers. Dual-purpose containers (casks) may be used which are designed for both storage and transport. Certain radioactive materials like used fuel and high-level radioactive waste can require additional shielding during internal transfers to reduce potential radiation exposure. The level of radioactivity will control the level of safety assessment and regulatory oversight demands, for instance based on the higher hazard level.

The international guidelines and regulations for safe transport of radioactive materials continue to be updated to account for best practices and towards harmonisation where possible. Some variations exist between practices of Member States that hopefully can be overcome in the future to reduce costs and risks while maintaining safety of transport.

These projects have received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreements n° 847593 and n° 945038.



7.3.3 Scenario development and FEP analysis, Domain Insight

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Please note: The statements made within this document are not necessarily the views of EURAD or any of its members. They represent the author(s) view on the most relevant knowledge about the topic at hand. The author(s) or EURAD assume no responsibility or liability for any errors or omissions in the content of this document. The information contained in this document is provided on an "as is" basis with no guarantees of completeness, accuracy, usefulness or timeliness.

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<http://www.ejp-eurad.eu>



Focus – WP ConCorD

The ConCorD (CONTainer CORrosion under Disposal conditions) workpackage aims to optimise both the performance and lifetime assessment of canisters for the disposal of spent fuel and high-level waste. After about 1 year of work, a comprehensive initial SotA report was recently published. The report covers the topics which form the core of the work planned and currently ongoing and identifies the open questions and remaining challenges that WP ConCorD aims to address. On one hand, the potential of novel technological concepts and materials for optimisation of disposal canister performance is assessed.

On the other hand, deepening of our understanding of coupled material degradation processes affecting canister performance, with focus on irradiation, microbial activity and near field transients, is a necessary step in order to increase the robustness and accuracy of canister lifetime assessments. The SotA has been well received by the radioactive waste and corrosion communities and its translation in Japanese is currently ongoing.

The completion of the SotA coincided with the organisation of the 8th LTC conference (Long-term prediction of corrosion in nuclear waste systems) in June 2022, in Switzerland. The event, where preliminary results from ConCorD were presented, allowed exchanges of several ConCorD stakeholders who were able to finally meet in person after the end of the pandemic lockdowns.



A few months later, in September, the IGD-TP symposium focused on the role of optimisation in geological disposal programmes offered the opportunity to showcase the optimisation potential of disposal canisters and the steps that EURAD and ConCorD are taking to reach that goal.





Focus – WP SFC

Outcome of the SFC Annual meeting on September 19-21st, 2022 in Kalmar, Sweden

More than 40 participants, with representatives from several end-users and IAEA were gathered to follow the outcomes of the “Spent Fuel Characterisation and evolution until disposal” project, SFC. An overview of each task was presented by the Task leaders and the technical sessions included scientific presentations of each subtask by the task members. Following each presentation were discussions on the outcome of the research.

The meeting also included a site visit to Clab (see picture), the Central Interim Storage Facility in Oskarshamn, which was much appreciated by the participants.

The work package continues to work very well and according to set plan. The pandemic has created delays, particularly for laboratory work in Europe, but most of these are dealt with the extension by one year of the work package, although there are some financial difficulties for a number of institutions due to their costs during the pandemic. The research done is of very high quality, and the different tasks work harmoniously. The dissemination in scientific journals and conferences are numerous. The outreach of the work package manifests itself through collaborations and off-springs at IAEA, NEA/OECD etc., which means that synergies are created that multiplies the initial invested resources and money. Knowledge and methodologies are spread amongst the European nations, not least to those with smaller and less advanced nuclear programmes. There will shortly be minutes for the meeting available.

The week continued with a meeting of the IAEA Coordinated Research project (CRP) also called Spent Fuel Characterization with many European and non-European participants, where also the EURAD SFC WP was presented in some detail.





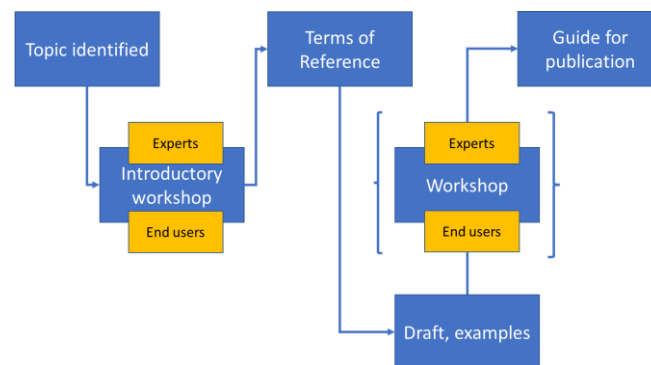
Focus – WP Guidance – Updated scheme of guidance preparation

The EURAD Guidance work package is developing a comprehensive suite of specific guidance documents that can be used by Member States with radioactive waste management (RWM) programmes that are at an early stage of development, but can be beneficial also to more advanced programmes.

After the so-called pilot guide was prepared, selection of topics for further guides has been started, based on our literature survey. A link was made between the existing guides and guide-like documents and the themes, sub-themes and domains of the EURAD Roadmap (signposting). The roadmap provides a hierarchical structure that facilitates definition of topics for further guidance. It allows capturing knowledge with the level of detail that is required by the end-user, from a broad overview down to an increasing level of detail. As the result of the signposting a theme-oriented 'Literature Catalogue' was developed, which could provide essential background primarily for countries making a first attempt to set-out their programme towards geological disposal of radioactive waste.

The screening of the existing guidance and guide-like technical documents (D12.7 – in final stage of review) has resulted in a vast quantity of information and knowledge sources that exist in relation to RD&D and technical programme management towards implementation of geological disposal of radioactive waste. As a result of our topic selection process finally "Requirements Management (RQM)" was selected as a topic of further guide production. The proper derivation and application of requirements play an important role during the implementation of any type of disposal facility from the site selection through construction and operation until closure, so this topic is of interest for most EU Member States.

The plan is to develop first a general guide on RQM, which will provide the necessary framework (framework guide) for the further specific guides. The framework guide could cover the general role of requirements in the implementation of the geological disposal facility (or any other disposal facility) during all phases. After finalising the framework guide on RQM, some examples of its application to particular processes in disposal programme implementation can be defined as topics for further guides (specific RQM guides) to be developed within EURAD.



Based on the lessons learned from the preparation of the pilot guide, WP12 improved the guidance production scheme to increase active participation of potential end users in the guidance development. As a starting point for drafting the framework guide a workshop will be organised, where invited experts will share their experience in preselected areas of RQM and plan the structure of the topic. The workshop will also provide opportunity for the participants – who could potentially be the end-users of the guides – to share their views and needs on the given topics. It might also identify co-authors and reviewers of the planned guide documents. This approach contributes to networking of experts in programmes at different stages and could lead to the creation of a community of practice in that RWM area.

We wish to invite all people who is or will be exposed to introduction or application of RQM as: (i) Experts responsible for formulation of requirements to implementation of repository implementation or planning (including RD&D), (ii) Experts responsible for preparing safety analyses and their evaluations

The initial workshop is planned for first half of November 2022 as online event. We ask all who are interested in this activity to contact WP 12 sending mail to: faltejsek@surao.cz.



A look back – NEA Workshops

Last July, EURAD was invited by NEA to participate to two workshops:

- NEA RWMC Workshop on Developing Safety Cases for Various Radioactive Waste Disposal Facilities - Needs and Challenges of RWMC Organisations
- Romania-Bulgaria workshop on stakeholder involvement

Piet Zuidema, Chief Scientific Officer participated to the first one as co-chair and gave three presentations on

- Long-term safety – similarities and differences in developing the elements of the safety case
- R&D needs – similarities and differences in developing the elements of the safety case
- Knowledge Management – challenges and future activities

Daniela Diaconu and Crina Bucur, from RATEN represented EURAD at the second workshop during a panel session on capacity building, education and training.



Romania-Bulgaria Workshop on Radioactive Waste Management and Stakeholder Engagement

Credit: NEA



A look back – ROUTES: 3day event in Cherbourg (France)



Visit of “Le Redoutable” nuclear submarine at “La cité de la mer” museum

For the third annual ROUTES meeting, a three-day hybrid event was organised in Cherbourg, France from 21 to 23 June 2022. The first day of the event was dedicated to ROUTES annual meeting, the second day to subtask 6.3 workshop, and visits of “La Hague” site (ORANO) were planned for the third and last day.

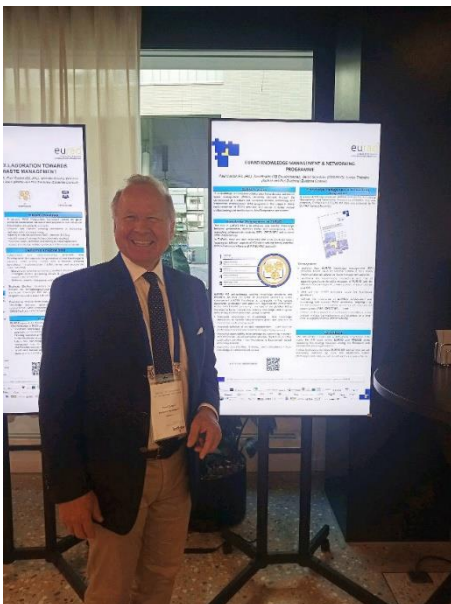
The annual meeting aimed to present the overall progress of the work package (WP); each task leaders presented recent activities and main results, and a presentation highlighted the technical challenges identified at this stage. Time for discussion was dedicated to the topics of “R&D propositions from ROUTES” and “how to improve connections with other WPs in Year 4”; a workshop will indeed take place in December 2022 on R&D recommendations for the future, and it was agreed to improve the interactions with EURAD WPs and European Commission projects (notably PREDIS). Finally, the participants played the Pathway Evaluation Process (PEP) game, dealing with various high-level radioactive waste management situations.

The workshop on the feasibility of developing further European shared solutions for waste management from cradle to grave was organised by the ROUTES task 6 leaders. The ERDO Association (Association for Multinational Radioactive Waste Solutions) was presented. It is an association of national organisations with a mission to work together to address the common challenges of safely managing the long-lived radioactive waste in their countries. Much of the knowledge base regarding shared solutions lies within the ERDO Association. Each task was asked about its level of interest, opportunities and/or needs for sharing; the results will be compiled in deliverable 9.14 (Report on the feasibility of developing further European shared solutions for waste management from cradle to grave), but some preliminary results show the great interest of mobile facilities. Then, the deliverable 9.16 was presented; it focuses on transparency when implementing shared solutions and was carried out by civil society experts interacting with the civil society group in the frame of the Task 7 of ROUTES. Finally, the main features of Task 6 deliverable 9.13, currently under review, was shared by the participants. This deliverable will gather 32 case studies on shared solution between Member States (MS) as well as the status of regulation for each MS.

In parallel of these meetings, a visit to “La Hague” site was organised on the last day of the event. Indeed, 10 people attended a general presentation of ORANO's activities and visited two facilities: a Spent Ion Exchange Resins (SIER) conditioning facility and an incineration and cementation of organic effluents facility. A more informal visit was finally organised at “La cité de la mer” museum in Cherbourg to see the nuclear submarine “Le Redoutable”.

 A look back – IGD-TP Symposium

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Mid-september, EURAD participated to the IGD-TP Symposium in Zürich, which gathered over 100 participants from 18 different countries.

The Symposium was dedicated to the role of optimisation in radioactive waste geological disposal programmes.

A special thanks to Nikitas Diomidis who gave a talk on ConCorD WP in the session “Technology and material optimisation”, to all WP leaders who were there to present various posters and to Paul Carbol who presented no less than 3 posters on Knowledge Management in EURAD !



Focus – EURAD-2

In August, following a request sent to the Colleges, the Core Group of EURAD-2 has been established. The six members and the coordinator of the core group held the first meeting in September 2022 (following the IGD-TP Symposium).

The role of this group is to liaise with the respective Colleges to gather feedback associated with review and validation of important milestones for the EURAD-2 proposal.

During the first meeting they reviewed the missions of the Core Group the lessons learned and best practice, developed the group's ways of working and set plan for moving forward in the EURAD-2 preparation.

The description and process for suggesting and deciding on EURAD-2 work packages will be provided by the Core Group by the end of 2022. Any parties interested in suggesting future WP topics should be in direct communication to their respective College, to ensure that these topics are relevant and also clearly reflected with the updated Strategic Research Agenda.

Who are the members of the EURAD-2 core group ?

- Coordinator : Louise Théodon (Andra – France)
- Research Entities representatives: Christophe Bruggeman (SCK-CEN – Belgium) and Lara Duro (Amphos 21 – Spain)
- Technical Support Organisations representatives: Erika Holt (VTT – Finland) and Nadja Železnik (EIMV – Slovenia)
- Waste Management Organisations representatives : Ingo Blechschmidt (NAGRA – Switzerland) and Astrid Göbel (BGE – Germany)

Find all communications on EURAD-2 on [Projectplace](#).



Now published

ACED – Initial State-of-the-Art (D2.1) - [Link](#)

The broader scope of the work package ACED is the assessment of the chemical evolution at the disposal cell scale involving interacting materials and thermal, hydraulic and/or chemical gradients by considering Intermediate Level Waste (ILW) and High Level Waste (HLW) disposal concept.

ACED – Conceptual model formulation for a mechanistic based model (D2.16) – [Link](#)

This deliverable presents conceptual and mathematical formulations of mechanistic-based models which take into account the initial state-of-the-art knowledge on models and parameters and are linked to the existing numerical tools. The conceptual, mathematical and numerical models are proposed for the following reference systems: 1) HLW disposal cell in granite; 2) HLW disposal cell in clay; 3) ILW disposal cell in granite; and 4) ILW disposal cell in clay.

ROUTES – Overview of issues related to challenging wastes (D9.5) - [Link](#)

This deliverable provides a comprehensive list of challenging waste considering the situation in participating Member-States; throughout practical case studies, it describes particular problems to be solved for these wastes considering pre-disposal and disposal steps. Last part of the document lists a first set of research needs and possible R&D topics that can help for a better management of the challenging waste.

Training and Mobility – Priority list and schedule for training and mobility (D13.4) - [Link](#)

This deliverable describes training topics (and by extension, mobility action topics) which are of high priority, meaning that little to no training courses are available on these topics. Examples are safety case production, treatment of uncertainty and waste acceptance criteria. WP13 is currently actively working on filling these gaps: a training course [on safety case development and review](#) was recently announced and a training on uncertainty management is also in the final design stage.



Upcoming events

OCTOBER

18-20: DigiDecom 2022

25-26: Digital Safety Case Methods and Development

NOVEMBER

02: EURAD L&L on “Stakeholder involvement”

07-10: RWMC Workshop on the Management of RW and Decommissioning in SMR/Advanced Reactor Technologies

NOVEMBER

15-17: 12th International Symposium on Clearance and Exemption

22-24: NEA- Remembering the past in the future: building awareness of radioactive waste repositories together

28-02: EURAD Training Course on Safety Case Development and Review



CIGEO is declared as a project of public utility

On 8 July 2022, the French official journal published the decree recognising the public utility of Cigéo, the French deep geological disposal project for High Level and Intermediate Level long lived radioactive waste. This decision acknowledges the general interest of Cigéo as a final disposal solution for the most radioactive waste produced in France.



The declaration of public utility (DUP) is a key stage in the licensing process of Cigéo project for the French National Radioactive Waste Management Agency (Andra). This declaration certifies the recognition of the general interest of the project with respect to the target priorities: protect both people and the environment from high- and intermediate-level waste in the very long term. Over 50% of this waste has already been produced and temporarily stored pending a long-term solution.

The declaration of public utility for Cigéo is not a construction licence for the disposal facility. This licence could be obtained after the processing of the construction licence application to be submitted to the French Nuclear Safety Authority (ASN) towards the end of 2022.

The application for the declaration of public utility for the Cigéo project was submitted in August 2020 to the Ministry of the Ecological Transition. The request for a declaration of public utility, after

examination and approval by the State services, the Environmental Authority, the General Council for the Environment and Sustainable Development, and 24 local authorities affected by the project, was the subject of a public inquiry in the fall of 2021. This public inquiry gathered 4,150 contributions and in December 2021, the inquiry board issued its unreserved favourable opinion with 5 recommendations. The report and the conclusions of the public inquiry noted that the inquiry «has brought numerous contributions from the public, most of them very well argued, the majority in favour of the project»

After the French Conseil d'Etat had examined the application, the French government signed the decree declaring the public utility of Cigéo in the French official journal.

After Finland and Sweden, France is the third most advanced country in terms of ensuring the final safety of the most radioactive waste.

« The declaration of public utility (DUP) is a key stage in the licensing process of Cigéo project for the French National Radioactive Waste Management Agency (Andra). This declaration certifies the recognition of the general interest of the project with respect to the target priorities: protect both people and the environment from high- and intermediate-level waste in the very long term. Over 50% of this waste has already been produced and temporarily stored pending a long-term solution. »

Pierre-Marie Abadie, CEO of the French National Radioactive Waste Management Agency.



NAGRA proposes “Nördlich Lägern” as the site for Switzerland’s DGR

In September, NAGRA has achieved an important milestone in the “project of the century” of deep geological disposal with the official announcement of the siting proposal.

Extract from the media release available on [NAGRA’s website](#):

The National Cooperative for the Disposal of Radioactive Waste (Nagra) proposes Nördlich Lägern as the site for a deep geological repository. Extensive investigations have shown that Nördlich Lägern is the most suitable site and has the largest safety reserves. This is where the quality of the rock is highest and it best encloses the radioactive waste – not only today, but also in the distant future. While the landscape at the earth’s surface will evolve, the deep geological repository will be protected because the rock deep below the surface offers the greatest long-term stability. In addition, Nördlich Lägern has the largest underground area suitable for construction, thus providing the greatest flexibility for the layout of the repository.

The Nördlich Lägern siting region is located in the Zürcher Unterland (lowlands in the northern section of Canton Zürich) in Northern Switzerland. The entrance to the repository, the so-called surface facility, is to be constructed in the Haberstal area in the community of Stadel in Canton Zürich. Nagra designated this site in collaboration with the region and the canton. Nagra plans to construct the encapsulation plants for the waste at the Zwiilag interim storage facility in Würenlingen. As Zwiilag has been in operation for years, this solution offers synergies and ecological advantages.

All siting regions are suitable, but Nördlich Lägern is best

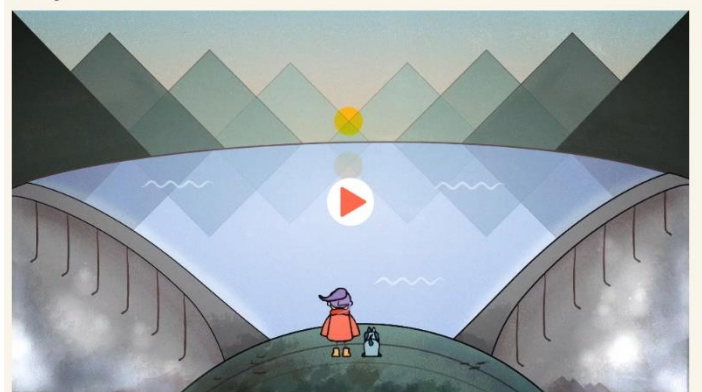
Nagra’s investigations have also shown that it is possible to construct a safe deep geological repository in all three siting regions – Jura Ost,

Nördlich Lägern and Zürich Nordost. However, Nördlich Lägern is the safest site.

With this siting proposal, Nagra is revising an earlier assessment. In 2015, Nagra was concerned that, based on the data available at the time, constructing the repository in Nördlich Lägern would be more challenging from an engineering perspective. The Swiss Federal Nuclear Safety Inspectorate (ENSI) criticised that these concerns were not sufficiently supported by data. As a result, all three regions were further investigated extensively. The results showed that Nagra’s initial assessment had been too cautious.

After decades of research, the foundation for the project of the century of deep geological disposal has been laid. Nagra will now prepare the general licence applications, which it expects to submit to the Federal Council in 2024. The authorities and the Federal Government will review these applications before the Federal Council and Parliament make their decisions. Should this decision be put to a national referendum, the Swiss voters will have the final say. Another thirty years or so will pass before Nagra can start waste emplacement operations.”

Why there?



NAGRA’s video [“How do you find a site for a nuclear repository?”](#)



Students Corner

Carlos Aguado – My stay in VTT Technical Research Centre of Finland

I work in the Unit of Nuclear Safety Research (UNSR) in CIEMAT since 2017, and within the EURAD WP8 – spent fuel characterisation and evolution until disposal (SFC) – for the last three years.

My work focuses on the thermo-mechanical characterisation of the spent fuel at the beginning and during the dry storage stage (WP8 ST3.1) and the assessment of the spent fuel behaviour under accident conditions during its dry storage and transportation (WP8 ST4.1).

From April to June of this year I visited VTT for a mobility action to work on the comparison of the fuel performance code FRAPCON-xt (CIEMAT's extension of the widely used code FRAPCON to dry storage conditions) with the code BISON, in terms of spent fuel initial characterization and the spent nuclear fuel performance during dry storage.

As major outcomes of this mobility, I have made my first steps and familiarized myself with a high performance computing code like BISON. The results of the comparison identified that the void volume modelling is the phenomena to enhance in FRAPCON-xt, in order to obtain more accurate results in terms of rod internal pressures. The results also have confirmed that fission gas release and in-clad hydrogen distribution modelling with the code FRAPCON and CIEMAT's subcode HYDCLAD (for the in-clad hydrogen behaviour) give more accurate results than those obtained with BISON, for the fuel rods studied.

The work, started with this mobility, is still ongoing, as it is planned to compare also the creep modelling of both codes during dry storage and to implement in FRAPCON-xt the enhancement in the rod internal pressures through BISON's void volume modelling.

I am very grateful to EURAD and CIEMAT to give me this opportunity and to VTT's reactor analysis team, especially Dr. Asko Arkoma for his technical support, but also for being a great host.





We are out there



Físicoquímica de Actínidos y Productos de Fisión @FFision · 14 juil. ...

Today @FFision has a SEM session at the @ICTS_CNME to analyse corrosion on irradiated metal samples related to @EJP_EURAD ConCorD project. Thank you Ana and Miriam! #nuclear



Físicoquímica de Actínidos y Productos de Fisión @FFision · 1 juil. ...

@FFision researchers co-authored this forefront study on ettringite structure. F. Colmenero from @UCM presented it today at the SEMSEA22 in Baeza, Jaén. Study related to our participation un CORI @EJP_EURAD @CIEMAT_OPI

