safe solutions for radioactive waste

IGD-TP Newsletter

Issue #5, July 2016

"By 2025, the first geological disposal facilities for spent fuel, high-level waste and other long-lived radioactive waste will be operating safely in Europe."

The European platform of "Implementers" is responsible for geological disposal of higher radioactive waste which has acted as a driving force to incubate ideas and carry numerous European Commission funded Research, Development and Demonstration projects from conception to reality, and ultimately to completion.

Editorial

Dear Readers,

During the 1st semester of 2016 no less than 10 specific project proposals were discussed amongst the Executive Group. Expectations are that at least 6 of these will be submitted for the EURATOM call 2016-2017. Many of these proposals expand the existing disposal focus of our joint activities to new topic areas such as predisposal activities, e.g. waste characterisation and storage of spent fuel prior to disposal.

One of the strengths of the IGD-TP lies in its ability to constantly revise its collective research priorities to reflect the various stages of its members' national programmes. Under future EURATOM calls these research priorities will be continue to be supported by a focus on scientific excellence, as well as activities supporting education and training. As a community it is vital that we are able to transfer knowledge and expertise from more mature programmes to the less advanced programmes. It is also important to recognise that we must be able to effectively transfer this knowledge and expertise from the generation who have designed the disposal concepts and facilities to those that will operate and ultimately close them.

A key strategic aim of the EC is to deliver excellent science via the most capable partners within the European Union. As a consequence, within the ongoing EC JOPRAD project, some organisations in the IGD-TP have developed a comprehensive dialogue with a number of nationally supported research entities and also with technical support organisations (TSOs) engaged to support national regulatory bodies. Current activities include the identification of possible areas for joint R&D work between implementers, academia and TSOs which could provide the basis for a future Joint Programme. Following the Regional Meeting held in Bucharest, February 3-4 2016, that successfully attracted representatives from 17 countries, a mid-term workshop is planned with the aim to present the outline of what could be a proposal for a Joint Programme of research in support of geological disposal. Some implementers that are members of the IGD-TP are actively contributing to this project until the end of 2017.

In this fifth issue of our newsletter, you will find news from our newly launched projects, as well as the programme for our next Exchange Forum that will be held in Cordoba, Spain, 25-26 October 2016. We continue to rely on your active participation in these discussions to fulfil our ambition of reaching the highest level of excellence and efficiency in research in the domain of Geological Disposal of higher activity radioactive wastes.

Monica Hammarström, IGD-TP Chair

Content

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EF7 ANNOUNCEMENT

7th IGD-TP Exchange Forum (EF7)

The IGD-TP 7th Exchange Forum will be held on 25-26th October 2016 in Cordoba, Spain. See Preliminary Agenda.

It will be an opportunity to update IGD-TP's EF participants on the platform activities during 2016, debrief the community on the recently completed BELBaR, LUCOEX and DOPAS projects and collectively explore the potential of future Joint Activities (through four subject specific working groups).

Exchange Forum 6, November 2015, London, UK

Furthermore, the Exchange Forum will also aim to summarise the future research needs as currently envisaged by WMOs, TSOs and Research Entities, and open the discussion up to the audience via a panel question and answer session.

This Exchange Forum will help in preparing for future projects, calls, and also initiate or increase interaction between research organizations, waste producers and Waste Management Organizations.

To fulfil the above objectives, EF7 will last two days and will dedicate significant time for presentations and discussions for 4 specific technical working groups mixing identified priorities and new domains of interest.

WG1 - Industrialisation and optimisation

WG2 - Canister Design

WG3 - High temperature clay interactions

WG4 - Spent fuel characterization Program for the Implementation of (geological) Repositories

The Exchange Forum is open to all stakeholders (technical or not) interested in geological disposal of radioactive waste. Participants are strongly encouraged to express their interest in participating in the Working Groups by submitting presentations of ideas or potential topics for the Working Groups.

PRACTICAL INFORMATION

Date and venue 25-26th October 2016, Cordoba, Spain, http://www.hotelescenter.es/en/hotel-cordoba-center/

Registration Please send your proposal or your ideas to the Secretariat before September 9, 2016, by sending the **registration form** at the following address: secretariat@igdtp.eu

Important dates

8 July	Announcement
9 September	Deadline for presentation
30 September	Deadline for registration
	Official invitation and final agenda available

IGD-TP NEWS & ACTIVITIES

JA11-a exchanging information on waste container materials

The technical community working on the durability of containers for the disposal of spent nuclear fuels (SNF) and, in some countries, high level waste (HLW) has has for a long time been exchanging information through a well-integrated network of experts in industry and academia around the world. In particular, the community has made effective use of a well-established international conference as a platform for formal and informal discussion (the 'Workshop on the Long-Term Prediction of Corrosion Damage in Nuclear Waste Systems', held every three years and first started in France in 2001).

Under the auspices of the IGD-TP, at the most recent of these events (Toronto on 9-12 May 2016), an informal meeting was organised by the JA11 leader (C Padovani, RWM) among key experts to discuss the state of the art of the scientific work underpinning estimates of the durability of disposal containers. Funding and logistic support was provided by the conference organisers (Peter Keech from the Nuclear Waste Management Organisation of Canada and Fraser King form Integrity Consulting, who are gratefully acknowledged).

The discussion covered disposal concepts envisaging the use of different container and buffer materials (including copper, steels and titanium) as well as different geochemical conditions. The meeting, attended by more than 20 industrial and academic experts from 10 different countries was very successful in baselining the current state of knowledge, discuss areas of current focus and identify areas where future work may be beneficial.

Based on the input received, current plans are to produce, over the next months, a short technical note summarising key points emerged. The aim of the note will be to help informing future activities of the IGD-TP in this area.

Towards a Joint Programming on Radioactive Waste Disposal - JOPRAD -

JOPRAD

ANNOUNCEMENT – JOPRAD Mid-Term Workshop

JOPRAD has planned a **Mid-Term Workshop** on 7-8th September 2016 in Prague, Czech Republic (Prague Congress Centre). The Mid-Term Workshop will enable "programme owners" and "programme managers" in EU Member-States to **evaluate the feasibility and the added-value of the implementation of a Joint Programming at European level**. The programme owners (i.e. ministries, national/regional authorities) are responsible for the implementation requirements of the Waste Directive 2011/70/Euratom in their respective countries. As part of their responsibility, they should provide a formal mandate to the organisations that will be in charge of carrying out RD&D in relation to radioactive waste management and in particular geological disposal (programme managers).

The **Vision for Joint Programming** i.e. the rationale (including benefits and challenges), the strategy and the technical common priorities will be presented at the Workshop. It will also outline the contractual instruments as well as governance rules and the possible financing schemes.

In addition, it is also intended for Civil Society stakeholders to declare their interests and manner of participation in the different activities, as well as participation in the governance.

The outcome of the workshop is to reach a common vision on the way forward to prepare and implement Joint Programming between Member States at a European level.

The Vision for Joint Programming

The Vision for Joint Programming is the result of the work of the 6 working groups within JOPRAD that are responsible for preparing the technical and organisational background for a common programme between all actors. After presentation of this Vision at the Mid-Term Workshop, the programme owners, programme managers, the European Commission (EC) and meeting participants will be invited to express their preliminary position on Joint Programming and evaluate if their needs are adequately covered.

Target audience

- Ministries, national/regional authorities (programme owners)
- Waste Management Organisations, Technical Support Organisations and Research Entities (programme managers) concerned with national research programmes and RD&D activities on radioactive waste management, including geological disposal.
- Finally, the Workshop is also intended for Civil Society stakeholders.

Registration

Registration form to be completed and sent via email to JOPRAD-MTW@joprad.eu by 31st July 2016.

The participation to this meeting is free of charge

Further information is available on www.joprad.eu .

New H2020 TECHNICAL PROJECTS

JA6 - Confidence increase in the safety assessment codes - Materials interactions

Cebama

Cebama first annual workshop

The 1st Annual Workshop of the CEBAMA project was held on 11-13th May 2016, in Barcelona, Spain, hosted by Amphos21. The workshop was attended by 60 participants coming mainly from the Project Beneficiaries but also members of the CEBAMA End-User Group (EUG). CEBAMA addresses key issues of relevance for long term safety and key scientific questions related to the use of cement-based materials in nuclear waste disposal applications. The project is implemented by a consortium with 27 Beneficiaries from EURATOM Signatory States, Japan and Switzerland. National Waste Management Organizations contribute to the running project by participation in the End-User Group, by co-funding Beneficiaries, and provide for knowledge and information transfer. The 1st Annual Workshop of the CEBAMA project was aimed at providing a forum for discussion and dissemination of scientific and technical project results, reporting and planning on future activities in CEBAMA.

With CEBAMA being 6 months into the experimental R&D programme at present, the 1st Annual Workshop was organized as a cluster-meeting, integrating several different elements, i.e. reporting by Coordination Team, meetings within ExCom, exchange with EUG and meeting of the General Assembly.

Parallel sessions of the three R&D oriented workpackages (WPs) on the first day were used to discuss technical aspects related to the individual WPs and ensure good cooperation and exchange both within each WP, but also between WP1, WP2 and WP3. The key component of the workshop were the seven hours of plenary scientific/technical oral presentations by the Beneficiaries from all WPs, focusing on presenting and disseminating first R&D results to the audience and discussing ongoing work. A separate poster session gave the opportunity to present further R&D details and was a very productive forum for additional discussions and exchange among the participants.

A specific Topical Session with invited speakers entitled "*Lessons learned from previous and current projects on cementitious barriers*" gave good insight into related projects of interest to the CEBAMA consortium. Talks were given M. Vuorio (on behalf of J. Hansen) on *DOPAS PROJECT: Experiences and lessons learned 2012-2016*, N. Michau *Results, lessons learned and residual uncertainties from the ECOCLAY II project*, and U. Mäder and V. Cloet *CI Experiment: Cement-Clay-Interaction. 5-year evolution of cement-clay interfaces*.

About 30 S&T contributions prepared by the Beneficiaries based upon the presentations given at the Project Workshop are under review by WP leaders and the EUG. The S&T contributions and posters will be published in the Proceedings, documenting and disseminating R&D performed in CEBAMA. The Proceedings will be published at KIT Scientific Publishing and available at www.cebama.eu later in 2016. It was decided at the Barcelona meeting that the 2nd Annual Workshop of CEBAMA will be held in Finland on 3 days in the week of 15-19th May 2017, hosted by VTT. The 2nd Annual Project Workshop will again be open to interested external participants and will be announced via email, or at the CEBAMA and IGD-TP Websites.

The 1st issue of the **Cebama newsletter** has been published in February 2016 and is available here.

Also available www.cebama.eu are the Public Deliverables which can be readily downloaded and are a source of additional information on the R&D performed in CEBAMA.

New H2020 TECHNICAL PROJECTS

JA6b - Microbiological issues

MIND

The MIND project had its first Project Annual Meeting on May 2-4 in Granada, Spain. There were 44 participants representing 17 organizations from academic institutions, research institutes, consulting companies, performance assessment, social science and end-users. The end-users that have showed interest to be involved in the review process of the MIND project are SKB, Posiva, TVO, ANDRA, NWMO, Nagra, RWM and ONDRAF/NIRAS. In addition, IRSN is following the project as an observer.

The University of Granada hosted the meeting.

The meeting started with a pre-workshop on May 2 with roundtable discussion concerning molecular protocols and experimental design working with clay. This was followed by one and a half days of presentations of the status of the different subtasks and meeting with the Project Executive Committee. There are no delays regarding milestones and deliverables in any of the Work packages. The different tasks have started as planned or with only minor delays and some interesting first results were presented. The meeting proceedings will be publically available on the MIND webpage from mid-June 2016.

There were 22 oral presentations and 15 posters that promoted interesting discussions. The MIND project is particularly grateful to the interest and enthusiasm showed by the representatives from ANDRA and NWMO.

The next MIND Annual Meeting will take place in the Czech Republic May 3-5, 2017.

MIND Newsletter 1

The 1st MIND newsletter was published in March 2016.

For more information about the project please visit www.mind15.eu or follow MIND on Twitter @mindh2020

New H2020 TECHNICAL PROJECTS

JA7 - Monitoring programme

Modern2020

Initiated in June 2015, Modern2020 project aims to provide the means for developing and implementing an effective and efficient repository operational monitoring programme, that will be driven by safety case needs, and that will take into account the requirements of specific national contexts and public stakeholder expectations .

Work package (WP) 2- Monitoring Strategies

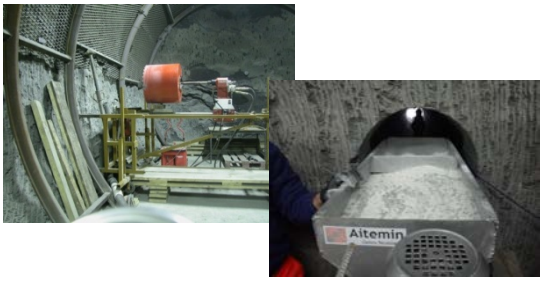
WP2 is established to understand what should be monitored within the frame of the wider safety cases and to provide methodology on how monitoring information can be used to support decision making and to plan for responding to monitoring results. A WP2 workshop was held in Stockholm, Sweden on 1-2 December 2015.

The over-arching goal of this internal workshop was to collate initial information on specific approaches being adopted by WMOs to establish their monitoring programme and plan the work to be done in Modern2020.

Another WP2 meeting was organized 23-24 February 2016 in Zurich, Switzerland to launch the task 2.2 on Screening test cases.

WP3 - Research and development on monitoring technologies

The kick-off meeting of WP3 was held in Spain (Madrid) on 6-7th October 2015. Partners presented the monitoring technologies they will develop within Modern2020.



Focus on Wireless Data Transmission Systems - Task 3.2

The Wireless Testing Bench to implement in Tournemire URL will provide the chance to evaluate the different wireless technologies under realistic and representative conditions. The setup consists of a horizontal borehole of 600 mm in diameter and 10 m in length provided with EBS components in which the wireless units can be installed and then replaced to allow the testing of different short range wireless solutions.

WP4: Demonstrators

A kick-off meeting of WP4 was organized in parallel to the DOPAS Seminar in Finland (Turku) 23-24th May 2016 in order to discuss technical details about the different demonstrators within Modern2020. A special focus was made in Task 4.5 on how to streamline the approach on the existing test set-up's which are currently running.

WP5: Successful stakeholder's engagement

Modern2020 intends to effectively engage local citizen stakeholders in the R&D monitoring activity by involving them at an early stage in a repository development programme in order to integrate their concerns and expectations into monitoring programmes. Public stakeholders from:

- Sweden: municipality of Osthammar
- Belgian: communities of Dessel and Mol
- Finland: municipality of Eurajoki

participate in Modern2020.

Further information available on www.modern2020.eu

NEWS from TECHNICAL PROJECTS

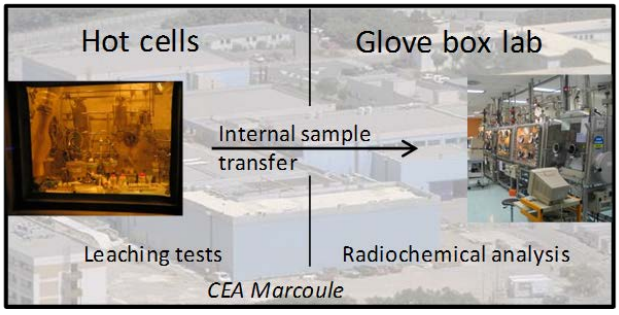
JA3 - Waste forms and their behaviour C14

CAST

The CAST Project (CArbon-14 Source Term) aims to develop understanding of the potential release mechanisms of carbon-14 from radioactive waste materials under conditions relevant to waste packaging and disposal to underground geological disposal facilities. The project began in October 2013 and runs for 54 months. 10 reports have been published on the CAST website since December 2015, including the second year annual reports from Work Packages (WP) 2 to 5.

In WP2, the final commissioning of experimental equipment and the preparation of samples for the leaching experiments with irradiated mild steel and stainless steels are now complete. The experiments are underway or expected to commence shortly.

In WP3, leaching of irradiated M5™ Zircaloy hulls in sodium hydroxide solution at room temperature commenced in February 2016. A similar experiment with irradiated Zircaloy-4 hulls will start in mid-2016. A joint WP2 and 3 meeting was held in June in Madrid.



Figures showing irradiated M5™ hulls (left) and a hot cell for leaching experiments and glove box laboratory for radiochemical analysis of samples (right) (both courtesy of CEA)

In WP4, the first measurements of the amounts of carbon-14 associated with wet spent ion-exchange resin indicated that about 75% of the carbon-14 is inorganic and the remainder is organic.

In WP5, results for the leaching in sodium hydroxide solution of samples of irradiated graphite from two French reactors found that most of the carbon-14 released is retained in solution (>95%), consistent with result of UK studies on carbon-14 release from graphite from a Magnox reactor. The majority of the carbon-14 in solution is inorganic but some is organic and after about 180 days approximately 30% of the carbon-14 in solution was organic.

In WP6, an overview report on state of the art of treatments of carbon-14 in safety assessments has been published. A WP meeting on 8/9th March 2016 in Switzerland focussed on the preliminary integration of results from CAST.

WP7 is organising the first CAST workshop and training course. The workshop will be held on 5/6th October 2016 in the Netherlands and will focus on R&D carried out in CAST and examples in national safety assessments. The training course will be held on 5/6th July 2016 in Germany on 'C14 behaviour under repository conditions' and will include lectures and practical training. The next CAST General Assembly Meeting will take place on 26/27th October 2016 in Switzerland.

The CAST website can be found at: http://www.projectcast.eu/

The project has received funding from the European Union's European Atomic Energy Community's (Euratom) Seventh Framework Programme FP7/2007-2013 under grant agreement no. 604779, the CAST project.

NEWS from TECHNICAL PROJECTS

JA2 - Full scale demonstration of plugging and sealing

DOPAS

DOPAS Project ends in August 2016 and a significant amount of lessons learned related to the implementation of plugs and seals are due to be published within the DOPAS Project. Some anticipation about the reporting was received at DOPAS 2016 seminar at the end of May 2016.

Over 100 participants from 50 different organisations around the world participated to the DOPAS 2016 seminar, which was arranged in Turku, Finland. The seminar was first topical seminar on plugging and sealing for underground applications in the waste management area. The first topical seminar represented all areas of nuclear waste disposal including waste management organisations, technical and scientific support organisations, universities, safety authorities, entrepreneurs and consultancy. This included countries where disposal of spent nuclear fuel and high-level and intermediate-level long-lived wasteis designed and construction of disposal facilities will be implemented soon and countries, where the decades long planning period for site selection and concept development has been initiated.

Over 30 oral presentations and 30 posters were presented in the DOPAS 2016 seminar. The poster sessions were held in conjunction with lunch and coffee breaks and it gave an opportunity to discuss and exchange information on plugging and sealing.

A site visit to Olkiluoto was arranged as part of DOPAS 2016 seminar on the third day and visitors heard about different functions at Olkiluoto Island and status of Posiva. One of the DOPAS Experiments, a wedge plug for deposition tunnel, POPLU was presented in detail and how the rock suitability classification was carried out for that experiment. The visitors from 16 different countries were able to see the ONKALO construction site, OL3 construction site and LILW-repository during the field tour.

More information will be available in the DOPAS Newsletter which will be published in June 2016.
All seminar materials will be available at http://www.posiva.fi/en/dopas/dopas_2016_seminar

DOPAS Experiment leaders presented the DOPAS Experiments at the beginning of DOPAS 2016 seminar

DOPAS Coordinator Johanna Hansen acted as DOPAS 2016 seminar chair.

Material samples from Full-scale Experiments conducted within DOPAS Project were informative

Poster session increased the networking possibilities for DOPAS 2016 participants.

Photo: Posiva

SAVE THE DATE!

ICONE24
Date: 26-30 June 2016
Place: Charlotte, USA

1st CAST training course
Date: 5-6 July 2016
Place: Germany

9th International Conference on Nuclear and Radiochemistry
Date: Aug. 29 - Sep. 2 , 2016
Place: Helsinki, Finland

JOPRAD Mid-Term Workshop
Date: 7-8 September 2016
Place: Prague, Czech Republic

Workshop on Planning R&D towards Geological Disposal
Date: 12-16 September 2016
Place: Ispra, Italy

1st CAST workshop
Date: 5-6 October 2016
Place: Covra, The Netherlands

IGD-TP Exchange Forum 2016
Date: 25-26 October 2016
Place: Spain

JOPRAD Programme Workshop
Date: 4 April 2017
Place: London, UK

MIND Annual Meeting
Date: 3-5 May 2017
Place: Czech Republic

CEBAMA 2nd Annual Workshop
Date: 15-19 May 2017
Place: Finland

More info on www.igdtp.eu