Implementing Geological Disposal of Radioactive Waste
Technology Platform

Conclusions & way forward for IGD-TP Towards H2020

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EF6 in a nutshell

- EF N°6, 3rd EF with ”working-group” approach
  - ✓ 4 working groups on topics that may be proposals for the next H2020 call
- 18 countries
  - ✓ EU countries and USA and Japan...
- 163 participants
  - ✓ We had to limit the participation!

Belgium
Bulgaria
Czech Republic
Finland
France
Germany
Hungary
Italy
Lithuania
Poland
The Netherlands
Romania
Slovenia
Spain
Sweden
Switzerland
United Kingdom
United States of America

Working together

- This, IGD-TP's EF 6, has attracted WMOs but also TSOs and Research Entities
- Amongst the 16 EU countries there are advanced and less advanced programmes
- We have developed with the support of EC not only technical projects but also guidance and position papers

✓ We are already operating a potential model for European Joint Programming on activities of interest and benefits for the whole community

Avenues for further exchange

- With IGSC-NEA
  - ✓ How much should we invest given the advanced position of the IGSC?
  - ✓ We can support advancement of networking in this critical area of Joint interest
  - ✓ Safetycase communication over long time scales and the presence of significant uncertainties is an area of great interest
- With radiation protection community
  - ✓ Thank you for the effort you have put in to identifying opportunities for collaboration
  - ✓ Suggesting creating an Information Exchange Platform with the aim of drafting a roadmap for future collaboration
- With SNETP
  - ✓ This EF has not a major focus on areas of shared interest with SNETP but we are keen to built on the good work of EF4 and EF5 for future collaboration

WG1 : Novel thermal treatment for Waste

A good European basis of end users, suppliers and research institutes exists to enable collaboration at European level, including developing a proposal for European funding. Such a proposal would need to consider:

- The need of strategic coordination at European level, including waste types and technologies of greatest interest, strategic benefits (costs, risk-reduction, etc.), and logistic issues associated with transport of wastes, samples and treatment plants
- An element of active demonstration for key waste types
- Consideration of both upstream (treatment) and downstream (disposal) outstanding technical questions

WG2 : Mechanical Homogenization in Bentonite (HomoBento)

- Currently considered in an optimistic way (full homogenization)
  - ✓ This has to be verified in the license processes
- Common issue in most programs
  - ✓ The working group had strong and common interests to contribute to the issue
- The conceptual understanding of homogenization is incomplete
  - ✓ Is the underlying physics correctly represented?
- Available numerical models are not able to predict experimental behavior
- Laboratory and field data are available
  - ✓ Possible to continue model improvement
- Strong benefit from a joint effort
- Off-spring from DOPAS, FORGE, LUCOEX and PEBS
- The number of interested partners could be ~30+
  - ✓ This includes WMO, TSO, Universities, Research organizations/companies
  - ✓ Will be a management challenge

WG3 : CORI

- **JA6b: Cement-Organics-Radionuclides-Interactions** *launched EG15*
- Outcome: Investigation of Cement-Organics-Radionuclides-Interactions is a relevant topic with potential implications for nuclear waste disposal.
- Outcome: The identified key topics in CORI, research tools and strategy allow to develop a R&D approach for investigating the CORI topics.
- *CORI suggests to develop a proposal for the next Horizon 2020 call.*

- **CORI proposal with four R&D oriented Work Packages:**
  - WP 1 “Degradation of organics - result of hydrolysis and radiolysis”
  - WP 2 “Mobility of organics in cementitious environment and their interaction with Fe”
  - WP 3 “Mobility of organics-RN complexes in a cementitious environment”
  - WP 4 “Synthesis, modelling, upscaling, application”

WG 4 : Spent Fuel Dissolution

DISCO: Modern Spent Fuel DISsolution and Chemistry in Container
Hypothesis: Modern fuel (advanced fuel and mox) dissolution differs only insignificantly from standard fuel.

General Hypothesis: Modern fuel (advanced fuel and mox) dissolution in real repository condiitions differs only insignificantly from standard fuel. (zero-hypothesis)

Motivation: there are knowledge gaps and need for extended data base for the modern fuels and for the chemical system in a degraded HLW waste canister

3-4 year project. Preliminary work package structure

- WP1 Management, Coordination and Dissemination/Knowledge Management
  SKB (Coord) , Amphos21
- WP2 Sample preparation and characterisation of the chemical systems (All)
- WP3 Fuel leaching experiments WP Leader: (Studsvik /KIT-INE)
  Contributors: Studsvik, KIT, ITU, CTM, SCK*CEN, Rez, CEA, (Hungarian contribution?)
- WP4 Model materials experiments WP Leader: (Univ. Cambridge/FZ Jülich), Contributors: FZ Julich, Univ. Cambridge, Univ. Sheffield, VTT, Ciemat
- WP5 Chemical modelling WP Leader Amphos21/PSI, Contributors: Amphos PSI, NNL, Andra, Quintessa

Towards Joint Programming?

- The JOPRAD project was launched in June 1, 2015 and IGD-TP has taken a leading role
- Duration 30 months
- 4 main events are planned
  - Regional meeting (Feb 2016) : engaging the LAPs
  - Mid term Workshop (Sept 2016): presenting the ideas for programmes and conditions for setting up a Joint programming (Hold point)
  - Programme workshop (May 2017): the JP “Vision”
  - Final Workshop (Nov 2017) : Decision to move forward

Boundary conditions

- To provide real added value relative to the current arrangements
- Administration costs should not exceed a clearly defined maximum % (incl. ongoing legal, EC admin., etc.) versus money spent on the science & demonstration. Surely this should not exceed 10% and preferably lower.
- Future arrangements must not detract from the non-financial benefits to implementers of participating in the IGD-TP (e.g. development of consensus approaches, sharing of lessons learned, work-in-kind collaborations, validation through benchmarking, etc.)

What would success look like?

- *A minimum number of mandated actors express their involvement (30…), including Advanced Programmes*
- *A suitable legal framework can be found*
- *A common long-term vision and a clear roadmap for the first five years of implementation can be agreed*
- *EC supports and builds on what exists and works*
- *Financial support for Joint Programming from the European commission relative to geological disposal meets foreseen needs*

Way forward for 2016-2017

- Keeping the Joint Activities alive (backbone of the IGD-TP)
  - Recognising limited human resources are a challenge
  - Efforts mainly borne by the WMOs…But all can contribute
- Knowledge Management via Joint activity workshops and improved use of existing web-based tools (ProjectPlace and Website)
- Working to ensure that Joint Programming is the right solution

Conclusion (1)

- IGD-TP is arriving now in a state of maturity with the development of two to three major technical projects per year, and, in this Exchange Forum, the engagement of more than 170 participants
- Our mode of organisation, voluntarily kept at the simplest as possible, has proved to be efficient due to strong membership involvement and a shared mindset of high work quality and personal commitment

Conclusion (2)

- The EC has supported the inception of the IGD-TP and its vision oriented towards the design, construction and operation of geological disposal
- We are positioned with all the research community, including the Technical Support Organisations and Research Entities, to build a common area of research to benefit all European countries
- Europe's progress is also attracting interest from American and Asian countries
- We urge the EC to continue to support geological disposal research priorities, and the IGD-TP… Look at what we have created together…

See you at the next EF7 in Spain !

EF7 October 25-26, 2016 organised by ENRESA

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