

Outcome of the Working Group 1 Cement

4th Exchange Forum, Prague
29 – 30 October 2013

Rapporteurs:

Lawrence Johnson
Bernhard Kienzler

SafeRock

Initiating group is asking the [IGD-TP to form a Working Group](#) on this topic

- Verify that there is a benefit from such a joint project
- Bring together interested organizations to form a consortium:
 - Prepare for a project proposal
 - Recommend support of such a project
 - Submit request in response to call

Background

- At the IGD-TP Exchange Forum in Nov. 2012, a presentation was made regarding interest in a TSWG on cement (CEBAMA).
- The Executive Group of the IGD-TP in Feb. 2013 requested that the WMOs be surveyed to determine their needs regarding studies on cement materials interactions in support of long-term safety.
- Responses were obtained from ANDRA, NDA, SKB, POSIVA, SURAO, NAGRA, ONDRAF/NIRAS
- A further discussion of CEBAMA took place at the Ghent Cement-Waste Workshop. There was broad interest from specialists in initiating a project. From the WMO's perspective, there was no consensus on how to move forward.
- WMO representatives had a further discussion on 11 Sept. 2013 on the question of areas of common interest.

Presentations during Working Group Cement

- Introduction and discussion of commonalities & differences among WMO concepts (L. Johnson, Nagra)
- Results and future plan of RWMC's R&D regarding cement-bentonite interaction (H. Owada, RWMC)
 - Interface cement-bentonite interaction, including in-situ measurement
- How do we treat cement in performance assessment? (F. Neall, Galson Sci.)
 - Emphasis on transport properties of degraded cement
- Thermodynamics and modelling (L. Duro, Amphos21)
 - View data available, kinetics, behaviour of system, volume of phases
- RN retention and redox conditions (M. Altmaier, KIT)

- Cementitious materials: state of the art (X. Bourbon, Andra)
 - Consideration of “industrial reality” with respect to
 - Influence of chemical evolution on hydromechanical properties
 - emphasis on low pH / low hydration heat cements
 - chemical evolutions and physical properties
 - clay chemistry „behind the interface“, cement/clay bonding (seals)
- Immobilisation of Radionuclides by a Cementitious Backfill (D. Read, Uni Loughborough)
 - Feasibility of chemical containment by long-term diffusion & advection experiments. Interaction of RN with organic ligands (cellulose degradation or superplasticisers).
- Status of the proposed CEBAMA project (B. Kienzler, KIT)

Discussion Basis for Cebama

WP No	WP title	Lead Org.
WP 1	Transport properties	PSI (?)
WP 2	Organics - cement interaction	?
WP 3	Radionuclide retention	KIT
WP 4	Steel corrosion	?
WP 5	Thermodynamics and modeling	Amphos21
WP 6	Knowledge, reporting and training	?
WP 7	Project management	KIT

Duration: 3 yrs. of experimental time

Why topics were removed

- Strengthen the project by focus on certain issues.
- Sharp focus allows more concentrated work by multiple groups, thus strengthening integration within the project
- Cement-organics-radionuclide interactions is a major topic in itself.
- Steel corrosion in cement widely studied by WMOs
 - Input will be provided for the project based on published information. (CAST project; WMO publication in preparation)

New Structure of Cebama

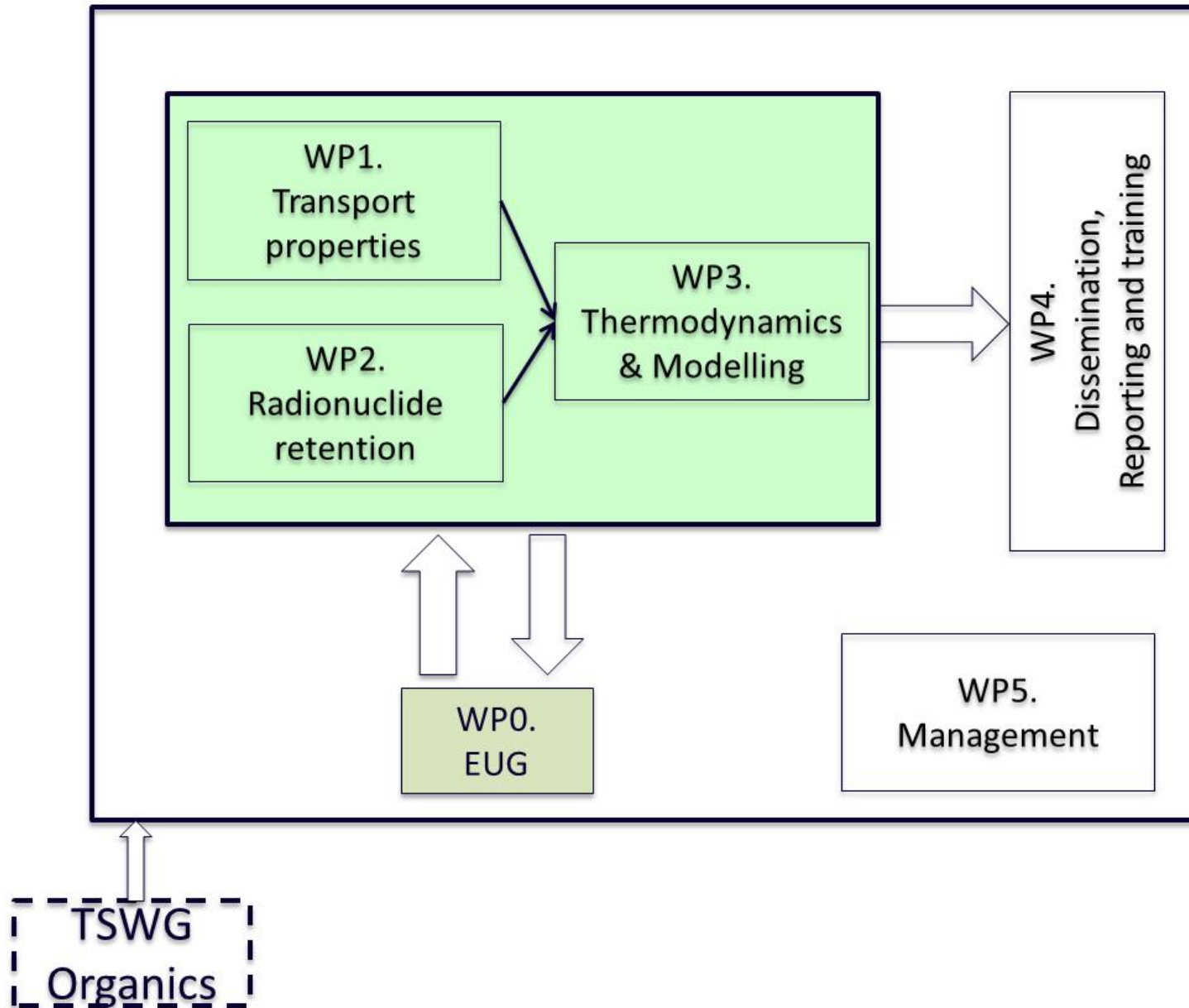
WP No	WP title	Lead Org.
WP 1	Interactions influencing transport properties	PSI (?)
WP 2	Radionuclide retention	KIT
WP 3	Thermodynamics and modeling	Amphos21
WP 4	Knowledge, reporting and training	?
WP 4	Project management	KIT

New TSWG: Review of Organics - radionuclides - cement interaction

- Provide State of the Art Report within the project

Provide Report on Implication of Steel Corrosion on cement and radionuclide behaviour

Possible structure of the project



Next Steps

- Circulate the WMO's responses to the questionnaire on cement issues to Bernhard.Kienzler@kit.edu
- WMOs formulate questions to be answered in the project
- Potential partners review the information and provide input where to contribute.
- Planning meeting in March 2014 at KIT defining priorities (Representatives from WMOs and R&D Orgs.)
- TSWG meeting on Organics - radionuclides - cement interaction (Representatives from WMOs and R&D Orgs.) (spring 2014)

Summary of the Cement WG

- Discussions within TSWG and with WMOs on cement issues over the last year resulted in a mature project basis
- Cement working group agreed upon the basis for a potential project covering
 - Interactions influencing transport properties
 - Radionuclide retention
 - Thermodynamics and modeling
- WMOs will formulate questions to be answered in the project
- Potential partners review the information and provide input where to contribute.
- Planning meeting in March 2014 at KIT defining priorities (Representatives from WMOs and R&D Orgs.)
- TSWG meeting on Organics - radionuclides - cement interaction (Representatives from WMOs and R&D Orgs.) (spring 2014)