

JOPRAD – establishing the programme: views of the waste management organisations

JOPRAD Regional Meeting, 3rd – 4th February 2016
Marshal Garden Hotel, Bucharest

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Contents

1. Aims and Terms of Reference of the WMO Working Group
2. Feedback from first meetings and discussions
3. Provisional list of WMO topics for JP
4. Next steps



Aims and ToR of the WMO WG

Task 3.1 of the project Work Package 3 (WP3) is aimed at:

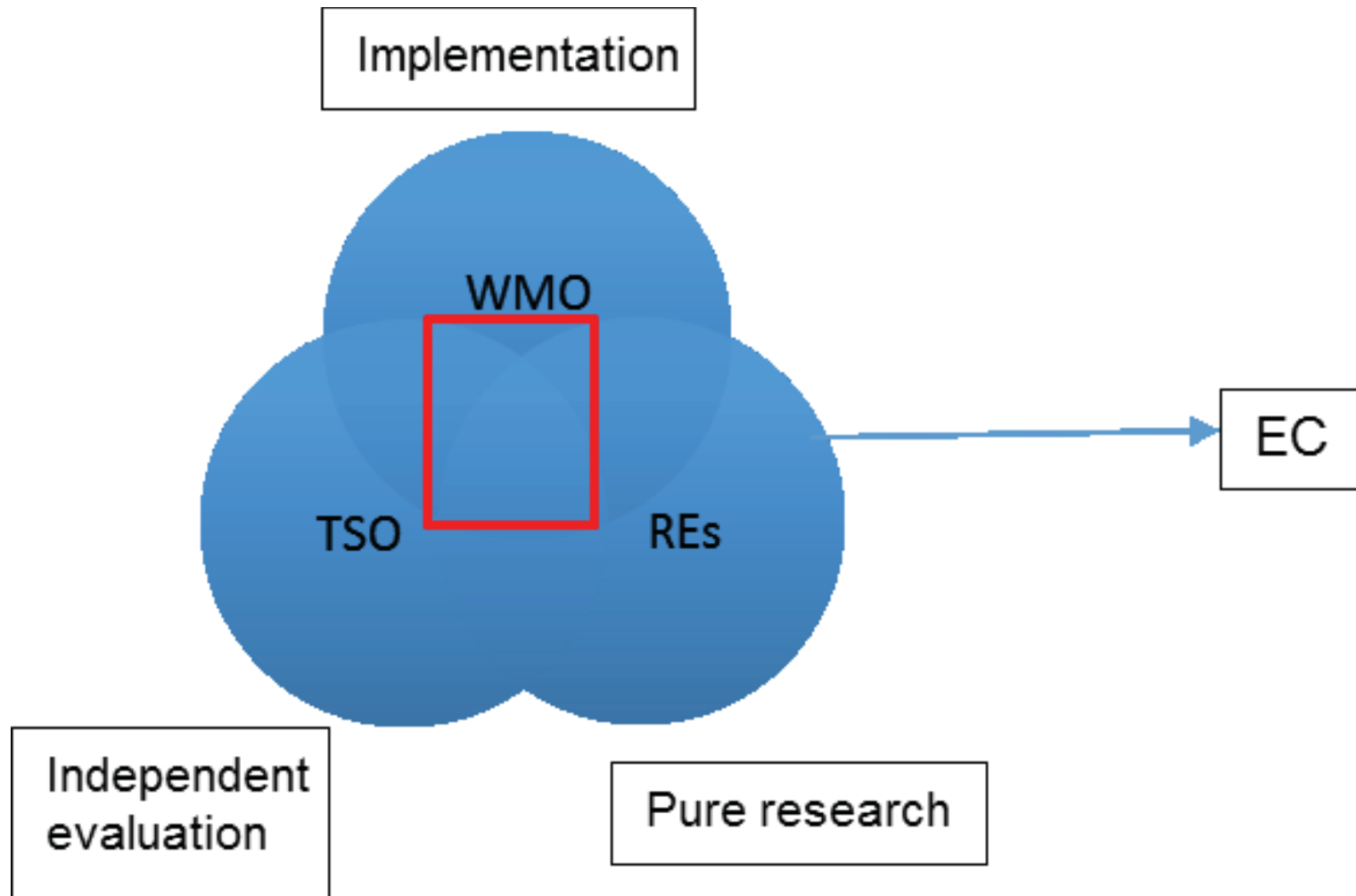
- Task 3.1: Identify key aspects of the IGD-TP's SRA that could be included in a common programme

The specific aims of the WMO working group are to:

- Identify the boundary conditions of the involvement of members of the IGD-TP Executive Group (EG).
- Identify from the WMO key topics/joint activities/planned proposals those that may be of potential interest for joint programming.
- Rank potential topics suitable for joint programming.
- Draw up a timescale for implementation of these potential topics.
- Liaise with other working groups (TSO's and research entities) and amalgamate potential projects together.



Aims and ToR of the WMO WG (continued)





Members of the WMO WG

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1st meeting April 2015, London

Areas suitable for possible Joint Programming were identified at first WG meeting April 2015, London:

- Established the Terms of Reference of the WMO working group
- Explored the boundary conditions for Joint Programming from a WMO perspective based on questions from the IGD-TP Executive Group
- Structure of RD&D topic prioritization table/questionnaire to WMO's agreed



WMO Questionnaire

Questionnaire structure

Topic number	List and Contents of the Topics for a given Key Topic	Past /current /future projects	Yes/no	What aspects of topic are you interested in	Timescale	To improve knowledge	To maintain competences	To develop new knowledge	To support LAPs	Others	Comments
1	Key Topic 1: Safety case										
1.3	Increase confidence in and further refinement of methods to make sensitivity and uncertainty analyses	REDUPP									

- Questionnaire sent out to 25 European countries (several countries have no WMO contact).
- 13 responses to-date from: RWM (UK), Surao (Czech Republic), Puram (Hungary), Andra (France), Enresa (Spain), Ondraf/Niras (Belgium), RATA (Lithuania), BfS (Germany), NES (Austria), Sogin S.p.A. (Italy), ARAO (Slovenia), Nagra (Switzerland). Sweden responded informally (but not as part of JOPRAD).

Analysis of questionnaire

% support calculated for each topic (% support from 12 responses). Top topics, based on % support are:

- Topic 1.1 – increased confidence in, and testing and refinement of the tools used in safety assessments (89%)
- Topic 1.2 – improved safety case communication (78%)
- Topic 4.1 – methodologies for adaptation and optimisation during the operational phase (78%)
- Topic 6.1 – monitoring strategies and programmes for performance confirmation (78%)
- Topic 7.1 – governance of decision making process (78%)
- Topic CC2 - competence maintenance, education and training (78%)
- Topic CC4 – communication (78%)



Analysis of questionnaire (continued)

There were several suggested additional topics arising from the analysis:

- Analogues,
- Chemotoxics
- Co-disposal
- Societal aspects
- Biosphere models
- Siting and site characterisation
- Development of the State of the Art
- Preparation of Site Descriptive Models
- Climatic evolution





2nd meeting September 2015, Ecurey

At the second meeting the working group:

- Reviewed the 37 existing IGD-TP SRA topics, 16 current joint activities, 4 related H2020 proposals and newly proposed joint activities were reviewed.
- Reviewed responses from the questionnaire arising from the first meeting in London in April 2015.

From these 51 topics were selected to be considered for joint programming.

Members of IGD-TP developed a list of eligibility categories to be used as a benchmark to determine the final list of topics to be included in a 'common area' for Joint Programming.





2nd meeting September 2015, Ecurey (continued)

- 22 topics identified to be progressed as JP for further consideration (9 were amalgamated from more than one original topic)
- ~20 topics proposed to be eliminated
- 2 topics for consideration by IGD-TP Executive





Eligibility categories

JP topic eligibility Categories **A** to **Q**

Fully eligible as technical activity	What might be acceptable by WMOs according to gov. rules	Unsuitable
A - Develop. & maint. of competence & fundamental science	F - Large scale demonstrator (e.g. DOPAS, ESDRED)	L - Compliance demonstration
B - Increasing confidence in supporting concepts (e.g. Cebama, Belbar, Mind)	G - Projects having an impact on social acceptance (e.g. aspects of MoDeRn)	M - Detailed technical development & design of repository (e.g aspects of DOPAS)
C - Early state RD&D	H - Benefit on gaining scientific & SOTA technical consensus	N - Time & mission critical RD&D
D - Very long-term studies (>10 years)	I - Development of common understanding of safety case content	O - Issue under discussion with regulation activities
E - Pooling of information, knowledge management	J - Development & validation of codes through benchmarking	P - Activities close in time to licencing
	K - Novel disposal components technologies (low TRL)	Q - Monitoring of complementary technologies & impact on geological disposal

Executive Group meeting 18 November 2015, London

At the IGD-TP Executive Group members, London, November 2015 reviewed:

- RD&D topics identified at the 2nd WMO working group meeting, Ecurey, September 2015.
- Topics resulting from the questionnaire not in the Ecurey list.
- Some SRA topics which were discounted at Ecurey were reinstated.

Several topics were amalgamated with 20 topics identified by the EG to be progressed for further consideration for Joint Programming.



WG activities up to 3rd meeting January 2015, London

- New list of topics created by WMO WG members December 2015.
- Eligibility categories were applied to this list by WMO WG members 11 January 2016 as an action from the Ecurey meeting
- At the 3rd WMO Working Group Meeting (20/01/16 hosted by RWM in London) – prioritisation of the list of topics took place





Provisional list of WMO topics for JP

Topic No.	Topic title	Priority Score (scores from Ecorey meeting)	Eligibility category	Potential Projects
1.1	Increase confidence in tools and methods used in safety cases taking into account uncertainty and communication	SCORE: 13.8 (2 of 20)	A, E, H and I	<p>Benchmarking (using natural analogues) and international comparisons to communicate safety case arguments.</p> <p>Improving understanding of role of geochemistry and hydrogeological conditions enhance confidence in safety cases for different geological environments.</p> <p>Interaction with IGSC topics.</p>
2.1	Release, dissolution and criticality issues of high burn-up fuels, ILW	SCORE: 11.6 (5 of 20)	A, C, E, H and J	<p>Impact of duration of dry vs. wet storage on high-burn-up fuels before transport to a repository.</p> <p>Laboratory and modelling based experiments to characterise dissolution and release rates.</p>
2.2	MOX fuel: relationship between structure & dissolution	SCORE: 6.5 (15 of 20)	A, B, C, D, E, H and J	<p>Sharing information/knowledge between programmes.</p> <p>Laboratory and modelling based experiments to characterise dissolution and release rates.</p>





Provisional list of WMO topics for JP

Topic No.	Topic title	Priority Score (scores from Ecurey meeting)	Eligibility category	Potential Projects
2.3	Improve data on vitrified HLW		A, B, D, E, H and J	Sharing information/knowledge between programmes. Laboratory and modelling based experiments to characterise dissolution and release rates.
3.1	Non-destructive testing information exchange	SCORE: 7 (13 of 20)	B and E	Knowledge transfer with application of techniques by other industries (e.g. oil and gas). Knowledge sharing of specific application of techniques to repository site characterisation. Improving understanding of Excavated Disturbed Zone (EDZ).
3.2	Knowledge preservation and development of state of the art	SCORE: 12 (3 of 20)	A, E and H	
3.3	Behaviour of bentonite-waste container interactions	SCORE: 9.9 (8 of 20)	A, B, C, D, E, F, G H, I, J, K	PEBS project scope. Temperature effects >100°C are part of a Working Group under Exchange Forum 7. Link to Topic 1.1 (safety case communication).



Provisional list of WMO topics for JP

Topic No.	Topic title	Priority Score (scores from Ecurey meeting)	Eligibility category	Potential Projects
3.4	Development and demonstration of low pH cements	SCORE: 9.5 (9 of 20) Suggest lowering priority as key work has been undertaken during ESDRED project.	A, C, D, E, F and K	
3.5	Long term behaviour of seals & plugs including cement based seals	SCORE: 9.5 (10 of 20)	B, D, F and G	
3.6	Salt backfill	SCORE: 1.5 (19 of 20) Discuss whether increase priority.	A, B, D, E and F	Long-term behaviour and properties. Influences of pressure and temperature on behaviour.
3.7	Development of alternative HLW container materials	SCORE: 12 (4 of 20)	A, C, D, E, H and K	The relative corrosion properties of specific container materials in isolation and in-situ within a composite under different chemical conditions.



Provisional list of WMO topics for JP

Topic No.	Topic title	Priority Score (scores from Ecurey meeting)	Eligibility category	Potential Projects
4.1	Adaptation and optimisation of disposal concept before and during the operational phase	SCORE: 7 (14 of 20)	E, F, G and I	Transfer of knowledge from WMOs from more to less advanced programmes. Methods of increasing efficiency and safety during operational phase. Topic 3.3 is an example of a project identified during assessment of how disposal system could be optimised.
6.1	Monitoring strategies and programmes for performance confirmation	SCORE: 11 (6 of 20)	D, E, F and G	
6.2	Evaluation of the impact of op. safety issues on the disposal system	SCORE: 10 (7 of 20)	F, G and I	How to evaluate impact of operational safety issue mitigation on the initial post-closure state. Sharing lessons learned from operational experience from more advanced to less advanced programmes to integrate changes into optimised designs.



Provisional list of WMO topics for JP

Topic No.	Topic title	Priority Score (scores from Ecurey meeting)	Eligibility category	Potential Projects
6.3	During post closure institutional control period and control period monitoring parameters & strategies	SCORE: 6 (17 of 20)	C, E, F, G and H	Transfer of knowledge from monitoring experience during storage of waste.
CC1	Nuclear knowledge management	SCORE: 5.5 (18 of 20)	A and E	
CC2	Communication of science, progress and Societal Aspects	SCORE: 15.5 (1 of 20)	E and G	



Provisional list of WMO topics for JP

Topic No.	Topic title	Priority Score (scores from Ecurey meeting)	Eligibility category	Potential Projects
Others	SNETP/IGD-TP WG	SCORE: 6.5 (16 of 20)	C, E, H and K	
Others	Chemotoxics	SCORE: 8.5 (11 of 20)	E and I	
Others	Site characterisation and preparation of site descriptive models	SCORE: 8.5 (12 of 20)	C, E, F, G and H	Improving understanding of geochemistry and hydrogeological condition to benchmark and enhance confidence in safety cases in different host rocks. Data management tool good practice.

Next steps

- ❑ T0+8: Regional Meeting (3-4/02/16 hosted by CVREZ/INR in Bucharest) – *take into account views of Less Advanced Programmes in WMO WG findings*
- ❑ T0+10: WP4 Meeting 1 (1 April 2016 hosted by RWM in London) - *production of “Programme document”*. Working Group with IGD-TP/SITEX/other programme owners and programme managers representing Research Entities
- ❑ T0+12: WMO Working Group 4th Technical Meeting (25/05/16 hosted by Surao) - *finalise WMO’s contribution to mid-term workshop which will take place in Prague Congress Centre, Czech Republic, 7-8 September 2016*



Thank You !



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