Rapporteur feedback slides from EF8 technical break out sessions

Technical topic ‘Heat-generating-waste containers’

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The research leading to these results has received funding from the European Union's European Atomic Energy Community's (Euratom) Seventh Framework programme FP7 (2007-2013) under grant agreements n°249396, SecIGD, and n°323260, SecIGD2.

Summary of working group attendees

- Extensive representation from WMO's, very helpful contributions from TSO's and active contributions from RE's.
- FR, DE, UK, BE, CH, CZ, SE, AU, ES, FI, EC, IT, PT
- All stages represented but focus on less mature concepts.
- Focus on clay geological environment

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Working group aims

- Knowledge share on heat-generating-waste containers and concepts which are at an early stage in the development lifecycle
- Discuss any changing needs and drivers for research relating to the topic of heat-generating-waste containers
- Explore opportunities for collaborative RD&D relating to ‘new-generation’ heat-generating-waste containers and implementation related concerns for both newer and well established concepts
- Capture areas where knowledge management activities may be beneficial
- Report findings back to executive group

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Summary of working group contributions

- 3 presentations from WMOs with active discussion following each presentation
- Areas covered: Ceramic containers, Coated containers and Supercontainers

- Ceramic technology is less mature and key vulnerability is mechanical properties
- In a clay geological environment do not generate gases as they corrode
- Corrosion rate is extremely slow
- Limitation on container length with current available technology (Spent fuel)
- Container closure is being actively investigated using a variety of thermal techniques
- No identified inspection technologies
- Nuclear waste disposal is the only area of industry which have a requirement for ceramic components of this scale
- There is interest in continued collaboration particularly in conjunction with coatings

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Summary of working group contributions

- There are a number of materials available for coating containers e.g. Cu, Ni, Ti, metal alloys and ceramic
- Containers require careful handling to ensure coating remains intact
- Sustainability benefits
- Container closure is main limitation and would require more research
- Other limitations include repair of coatings and inspection techniques
- Cost of some coatings can be relatively high
- Still susceptible to corrosion issues seen with single metal containers but behaviour can be more predictable
- Offer to host a meeting to discuss areas for collaboration from BEP surface technologies

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Summary of working group contributions

- Driver for supercontainer concept – operational safety
- Benefits to using industry standard products over natural products (predictability and QC)
- Main limitation is keeping cement intact
- Benefits of shielding in operational phase
- Sharing of knowledge beneficial, broad concept has potential but driven by requirements of specific geological environments
- Less potential for collaborative RD&D

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Conclusions and suggested way forward

- Ceramics are promising but represent a significant challenge due to low TRL
- Opportunity to drive ceramics forward at pace is through industry collaboration
- Majority of the room supportive of further discussion on coatings across all actors
- Opportunity to create adaptable designs
- Coated contrainers most transferrable
- Understanding other factors e.g. heat also needs to be considered in development

Action – follow up meeting to discuss concepts that include ceramics and coated containers

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