WAC 1 Webinar Summary

Webinar Date	April 21, 2021
Webinar Time	09:00 to 12:00 CEST
Chair	Lumir Nachmilner
Prepared by	Lumir Nachmilner and Tim Schatz

Background

The PREDIS project hosted a technical webinar (*Waste Acceptance Criteria 1: Information and Resources*) on April 21, 2021. This webinar was aimed at providing information on existing project and institutional activities regarding WAC. The program (see Appendix 1 for agenda) for this webinar consisted of two sessions of presentations by invited speakers: a session on EU projects with WAC components and a session on other international programs regarding WAC issues.

- Lumir Nachmilner (CVREZ) provided information on Task 2.3 of the PREDIS project on waste acceptance systems. The objective of this task is to create guidance documents on establishing components of a waste acceptance system for programmes of different sizes and stages of development. This guidance will include an overview of methods used for the physical/chemical characterisation of waste forms/packages and their assessment with respect to their effectiveness, considering technical and economic aspects, advice on an approach and practicalities regarding the qualification process of waste forms and establishing generic WAC that can be used by programmes with different levels of development prior to having official disposal options.

- Liz Harvey (GSL) gave an overview and update of EURAD-ROUTES Task 4 "Identification of WAC used in EU Member-States for different disposal alternatives in order to inform development of WAC in countries without WAC/facilities." The general objectives of this task are to provide an up-to-date overview in Member-States on the use of WAC at different stages in the waste lifecycle 2, offer a structured approach to support decision-taking of "no regret" waste management measures 3 and identify R&D needs and opportunities for collaboration between Member-States. Memorandum No. 1 from Subtask 4.1 on current use of WAC is publicly available.

- Crina Bucur (RATEN) shared outcomes from the CHANCE project on WAC. One aim of this project was to establish at the European level a comprehensive understanding of current conditioned radioactive waste characterization and quality control schemes across the variety of different national radioactive waste management programmes based on input from end-users such as WMO, regulators, waste producers and repository operators. It was found that basic assumptions for safety studies or identification of parameters evaluated through WAC could be harmonised, but that specific safety relevant parameter values could not.

- Benjamin Frasca (ANDRA) gave a presentation from work in the THERAMIN project on using generic criteria for evaluating the disposability of thermally treated wastes. A set of generic disposability criteria was proposed, and it was concluded that it could be used to evaluate any form of waste product, from any thermal treatment, for disposal in any type of facility.

- Alessandro Iovene (CAEN) provided an overview of the MICADO project. The goal of the project is to deliver a platform for non-destructive radiological analysis capable of defining the characterization procedure for the supplied waste package, determining the best measurement geometry and waste category and providing a complete integrated waste management solution for the full traceability of the waste.

- Angelo Paratore (SOGIN) gave a presentation on the efforts of the ERDO-LWC (Legacy Waste Characterization) Project. This project was launched in February 2020 with the objectives to survey the main legacy waste streams in the interested countries looking for similarities and possible sharing of waste management facilities/knowledge/best practices, to identify the minimum set of WAC (physical-chemical-radiological) to be respected by legacy VLLW-LLW or ILW packages for envisaging possible re-treatment/re-conditioning processes and disposability to a National or Multinational Disposal Facility and to evaluate possible methodologies for quantitatively deriving the missing characterization data for the legacy waste streams. The ultimate goal of the ERDO Association is enabling the establishment of one or more shared multinational waste management solutions.

- Soufiane Mekki (NEA) discussed NEA activities on WAC. This presentation included an overview of the NEA standing technical committees and recent developments in the Radioactive Waste Management Directorate. The Expert Group on Operational Safety (EGOS) within the Integration Group for the Safety Case (IGSC) focuses on WAC as part of its programme. At present there is a draft study on the development of WAC under review.

- Rebecca Robbins (IAEA) shared the IAEA perspective on WAC. WAC were described as the link between radioactive waste management operations as well as between responsible parties (waste generators, waste processors, waste storage operators and waste disposal operators). WAC also establish characterization objectives & underpin and inform sampling & characterization plans. Establishing adequate waste inventories (particularly for legacy wastes), characterization and sampling, safety case development, interdependencies between RWM steps, absence of operating disposal facilities, waste form performance and information/knowledge management were highlighted as remaining WAC-related challenges.

The presentations are available on the PREDIS website (https://predis-h2020.eu/wac1-webinar-21-4-2021/).

Following the formal presentation sessions, a set of small group discussions were held. Attendees were randomly assigned to 1 of 4 moderated breakout rooms. The aim of the 30-minute discussion session was to gather perspectives framed around the following questions (although discussions were not limited).

- Which challenges in developing or modifying waste acceptance criteria will the presented project outcomes/objectives have the most impact on? Which challenges need to be further addressed?
- Are the needs of less mature RWM programmes (e.g., those without repositories) being addressed in ongoing projects? What is missing?
- Do the available WAC guidance documents (IAEA, NEA-OECD, EC Projects) provide enough information? Can they be improved?
- Is there sufficient need and interest to advocate for developing a document comparing the different approaches in WAC against a background of the national boundary conditions?

In all, more than 200 participants registered to attend the webinar from 37 countries including some from outside Europe. Representation was divided between PREDIS end user group members + general stakeholders and consortium partners at 37% to 63%. A total of 177 people joined the webinar over its duration.

Live-polling was conducted during the webinar. Poll questions were intended to gauge feedback and opinions on the main WAC-related obstacles to the management of radioactive waste, the most challenging aspect of WAC and the approach to predisposal management in the absence of WAC.

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Outcomes

Some key takeaways from the deliberations of the discussion sessions were as follows:

Challenges in developing or modifying WAC

- The requirements and limitations of all steps in the waste management lifecycle need to be considered when developing WAC. Early information helps to optimise activities.

- How can new waste packages be most effectively introduced into systems with existing WAC? It can be challenging to integrate new innovations into waste management while also demonstrating that WAC are fulfilled. Generally, there is greater confidence in using established (tried and tested) approaches.

- The development and preservation of archives on the properties of known and available waste packages could be helpful.

- Harmonisation of (preliminary) WAC among countries could be useful but will depend heavily on the level of detail at which such harmonisation is to be applied as well as who (waste generator, WMO, regulator, etc) is responsible for its application. Some criteria could be applied at a high level.

- One of the challenges is the determination and development of the methodology of quantifying parameters for the important features of WAC.

- A systematic application of common criteria would help to ensure the widespread application of best practices.

Needs of less mature RWM programmes

- Lack of clear regulations may result in indefinite storage of waste.

- Ideally, WAC would be used not only for a box-checking exercise, but also as an instrument to help design a national policy for waste management.

- Possibly, conditioning technology can be purchased along with information on the long-term performance of the product waste forms.

- Reconditioning of waste packages originally produced without WAC will be needed.

- For programs without candidate sites for final disposal, it is difficult to determine what conditioning options are suitable for long-term storage. Is storage of final waste packages the best solution when they are derived from generic WAC and not site-specific safety case information?

Highest priority activities

- Shared approaches/solutions regarding predisposal (especially characterization) and regulatory activities are needed.

- The sharing of waste management facilities (fixed installations, modular or mobile options) should be explored.

- Considerations other than radiological WACs may apply, chemical and toxic elements may be as important to disposal. Regulations and requirements relating to hazardous / toxic waste may require a different (possibly conflicting) approach to waste management compared to those defined for radioactive waste.

- ▣ Characterization (and representative sampling) is a clear challenge to WAC development, particularly for legacy wastes.

Gaps

- ▣ The trade-off between early conditioning and postponed conditioning should be explored.

- ▣ In many cases, there is no option to postpone conditioning (i.e., storage of raw waste is not permitted). It would be useful to know how these situations are universally handled.

- ▣ There seems to be a communication gap between the field of characterization (which is generally laboratory-oriented) and the field of WAC establishment (which is generally engineering-oriented). Maybe an explicit account of measurement uncertainties in the establishment of WAC could serve as a bridge.

- ▣ Does a new "final conditioning" step need to be introduced into predisposal waste management?

General

- ▣ Information (from the presented projects, etc.) about characterization is useful.

- ▣ When using preliminary WACs in waste management, it is advisable not to be overly conservative.

- ▣ The large number of projects and activities (EC, IAEA, NEA, …) on the same subject may lead to conflicting results if high-level cross checking is not performed.

Live-polling indicated (see Appendix 2 for all live-polling results):

- ▶ The majority of respondents considered the absence of disposal facilities to be a main obstacle to the management of radioactive waste.

- ▶ The majority of respondents agreed that defining appropriate WAC and checking compliance (including characterisation) are the most challenging aspects of WAC.

- ▶ Respondents were somewhat evenly decided that, in the absence of disposal solutions and/or WAC, waste should be treated but not conditioned, waste should be treated and conditioned according to best practices or waste should be treated and conditioned based on preliminary WAC.

Overall, the level of interest and satisfaction with the WAC 1 webinar was favourable. The webinar had a high retention rate (> 52%) to its close. Preliminary analyses of participant responses to a post-webinar survey also indicated a good level of satisfaction (average overall score of 4.5/5.0). Participants also reflected that the topical webinars are allowing PREDIS to have a wide impact.

Appendix 1. WAC 1 Webinar Agenda

PREDIS

Waste Acceptance Criteria I: Information and Resources
Free webinar on April 21 from 9-12 CET

Agenda

09:00 to 12:00 CET

Introduction

    09:00-09:10 CET Welcome & Introduction

Experience from EU projects

09:10-09:20	PREDIS (Lumir Nachmilner, CVREZ)
09:20-09:30	EURAD-ROUTES (Liz Harvey, GSL)
09:30-09:40	CHANCE (Crina Bucur, RATEN)
09:40-09:50	break
09:50-10:00	THERAMIN (Benjamin Frasca, ANDRA)
10:00-10:10	MICADO (Ferdinando Giordano, CAEN)

Experience from other international initiatives

10:10-10:25	ERDO/LWC (Angelo Paratore, SOGIN)
10:25-10:40	NEA (Soufiane Mekki)
10:40-10:55	IAEA (Rebecca Robbins)
10:55-11:10	break

11:10 to 11:45 CET – Breakout room discussions

11:45 to 12:00 CET – Close

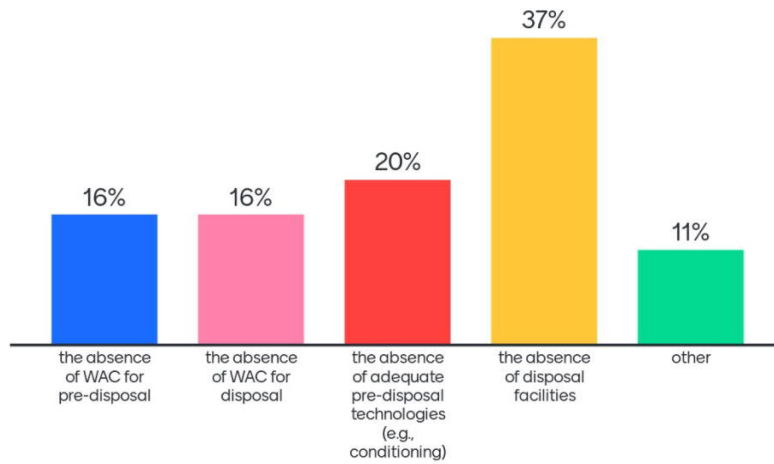|	
11:45-11:50	Feedback from breakout rooms
11:50-11:55	Summary and Conclusions
12:00	Adjourn

Appendix 2. Live-Polling Results

What are the main obstacles to the management of radioactive waste?

Mentimeter
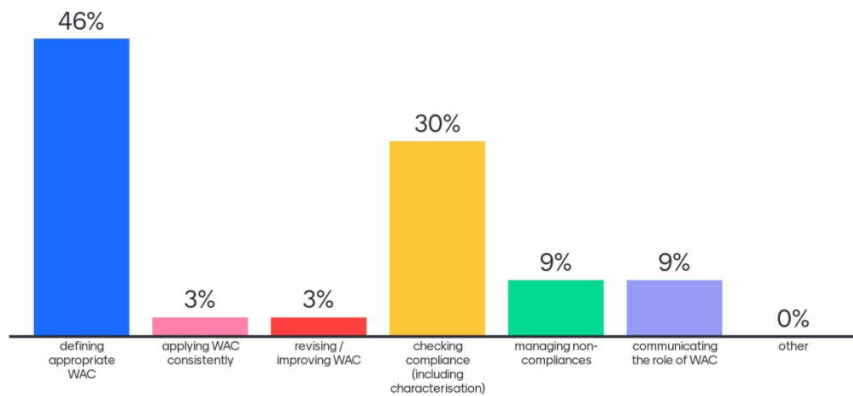

- the absence of WAC for pre-disposal — 16%
- the absence of WAC for disposal — 16%
- the absence of adequate pre-disposal technologies (e.g., conditioning) — 20%
- the absence of disposal facilities — 37%
- other — 11%

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What aspects of WAC do you consider to be most challenging?

Mentimeter

- defining appropriate WAC — 46%
- applying WAC consistently — 3%
- revising / improving WAC — 3%
- checking compliance (including characterisation) — 30%
- managing non-compliances — 9%
- communicating the role of WAC — 9%
- other — 0%

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