CHANCE project

(Contract Number: 755371)

End-User-Group Questionnaire

DELIVERABLE (D2.1)
Work Package 2

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D2.1 End-User-Group Questionnaire

Written: C. Bucur
Organisation: RATEN
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Draft	Initial version	RATEN	

Reviewed by
End User Group

Approved by
The Executive Board

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Content

1. Introduction

This document describes the questionnaire produced by CHANCE Work Package 2 & 6 and addressed to the members of End Users Group (EUG). Based on the answers collected by means of this questionnaire the requirements and methodologies for the characterization of conditioned radioactive waste used in different national contexts will be evaluated. The questionnaire will be also used to underlying socio-technical and ethical frameworks of radioactive waste characterisation practices and policies.

This document describes the questionnaire produced by CHANCE Work Package 2 & 6 to obtain a broad overview on the end-users needs for the characterisation of conditioned radioactive waste and to appreciate how the members of End User Group (EUG) perceive the activity of waste characterization in relationship with the evolution of the national disposal programme, in terms of importance with respect to the whole back-end of the fuel cycle, or in terms of uncertainty management within each organization.

The information collected will be used to identify:
➢ key parameters that need characterization;
➢ technologies/methods commonly used for characterization of conditioned waste;
➢ waste acceptance criteria applied and the possibilities of their harmonization in Europe
➢ specific problematic issues for the characterization of conditioned radioactive waste;
➢ R&D needs and potential on-going R&D programme on the topic of conditioned radioactive waste characterization;
➢ potential applications of R&D actions to be included in CHANCE;
➢ socio-technical and ethical issued associated with the waste characterization process.

A synthesis of commonly used methodologies for conditioned radioactive waste characterization and end-users requirements and concerns will be produced based on the questionnaire analysis. Also, the R&D needs on characterization of conditioned radioactive waste will be synthetized.

The outcome of this analysis will additionally be used to refine the dissemination and communication strategy of the CHANCE project.

The questionnaire consists of 18 questions and it is comprised of the following parts:
o Part I - general information on CHANCE project and the aim of the questionnaire
o Part II - personal details for the representative of EUG
o Part III - 18 questions with allocated spaces for answers
o Part IV - a guidance to answer the questions

2. Questionnaire presentation

2.1 General Information

The CHANCE project "Characterization of conditioned nuclear waste for its safe disposal in Europe" aims to address the specific issue of the characterization of conditioned radioactive waste to be disposed of in a dedicated repository. The project started on 1st June 2017 for a 4 years period.

The present questionnaire has been designed to gather as much information as possible about the important characterization requirements for conditioned radioactive waste to be disposed of in an appropriate repository in one of the European states. Information on CHANCE objectives and tasks can be found on the project website: www.chance-h2020.eu.

This questionnaire has been produced by CHANCE Work Package 2 to obtain a broad overview on the end-users needs for the characterisation of conditioned radioactive waste. It also includes questions pertaining to Work Package 6, related to underlying socio-technical and ethical frameworks of radioactive waste characterisation practices and policies. More specifically, these questions aim to appreciate how your organization perceives the activity of waste characterization in relationship with the evolution of your national disposal programme, in terms of importance with respect to the whole back-end of the fuel cycle, or in terms of uncertainty management within your organization.

The information collected will be used to identify:
- ➢ key parameters that need characterization;
- ➢ technologies/methods commonly used for characterization of conditioned waste;
- ➢ waste acceptance criteria applied and the possibilities of their harmonization in Europe
- ➢ specific problematic issues for the characterization of conditioned radioactive waste;
- ➢ R&D needs and potential on-going R&D programme on the topic of conditioned radioactive waste characterization;
- ➢ potential applications of R&D actions to be included in CHANCE;
- ➢ socio-technical and ethical issued associated with the waste characterization process.

A synthesis of commonly used methodologies for conditioned radioactive waste characterization and end-users requirements and concerns will be produced based on the questionnaire analysis. Also, the R&D needs on characterization of conditioned radioactive waste will be synthetized. The outcome of this analysis will additionally be used to refine the dissemination and communication strategy of the CHANCE project. Your answers to this questionnaire thus are vital for the CHANCE project in particular and for improving the characterization of conditioned nuclear waste for its safe disposal in Europe in general. We thank you very much in advance for your cooperation!
This questionnaire consists of 18 questions and a guidance to answer these questions is included.

Please return your completed questionnaire to both Crina Bucur (crina.bucur@nucear.ro) and Stéphane Plumeri (Stephane.Plumeri@andra.fr) by 1st July 2018.

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2.2 Personal Details
You name and surname:
Name of your organization:
Your role in the organization:
Email address:
Postal address:
Country:
If you are replying on behalf of a government, academic/research organisation, industry association, non-governmental organisation or any other type of organisation, please: - *specify the type of organisation* - *briefly describe your organisation, including scope and field of activity in relation to radioactive waste management*
Please indicate the preferred transparency level your answers must have by clicking directly on the corresponding boxes below: ☐ Fine to publish the whole questionnaire with name ☐ Fine to publish the whole questionnaire anonymously ☐ Just use the answers as part of a general overview / statistical analysis

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2.3 Questions

Q1. What types of radioactive waste, including spent fuel, are managed by your organization?

Waste category	Yes/No	Main origin	Comment
Very low level waste[*]			
Low level Waste[*]			
Intermediate level waste[*]			
High level waste[*]			
Spent fuel			
Other			

*Classification of radioactive waste taken from IAEA General Safety Guide N° GSG-1

Q2. What is the option for storage / disposal of the radioactive waste and spent fuel in your country?

Waste category	Storage / Disposal option	Existing/Project
Very low level waste[*]		
Low level Waste[*]		
Intermediate level waste[*]		
High level waste[*]		
Spent fuel		
Other		

*Classification of radioactive waste taken from IAEA General Safety Guide N° GSG-1

Q3. What are the waste acceptance criteria (WAC) for the storage / disposal facilities identified above in Q2 (operational and foreseen to be commenced in the future)?

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Q4. Should WAC be harmonized across Europe? If so, how?

Q5. How do you deal with the fact that the WAC as well as the final disposal concepts are in constant evolution (techno-scientific progress, experiences, stricter attitudes …)?

Q6. What methods are you applying in characterisation of conditioned radioactive waste?

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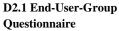
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Q7. What are the uncertainties associated to the methods you are currently using in radioactive waste characterisation?

Q8. Which other uncertainties (e.g. technical, conceptual, social, political, ethical) do you anticipate with regard to waste characterisation for safe disposal? Please list the three in your opinion most important ones. How do you deal with these uncertainties? Can they be managed?

Q9. Do you have in your country / organisation waste categories and/or waste forms that do not have a dedicated option for storage / disposal? If yes, are you characterizing them?

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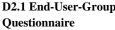
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Q10. What are the major technical difficulties you encounter in characterising your conditioned radioactive waste?

Q11. What are the R&D needs that could solve the difficulties identified in Q10?

Q12. Do you have an on-going R&D programme covering the radioactive waste characterisation?

Q13. The CHANCE project will address and develop some specific techniques: Calorimetry, Muon Tomography and Cavity Ring-Down Spectroscopy (for details see www.chance-h2020.eu).

Do you foresee an application of one of these techniques in your radioactive waste characterisation?

Q14. In your country, who is in charge of characterization and who is in charge of control? How these processes are structured and followed up?

Q15. What is the role of host communities in the above mentioned processes?
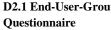
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Q16. Which disciplines / fields of expertise / actors are involved in the characterization of conditioned waste in your country? Is there any missing in your opinion?

Q17. In your opinion, why is waste characterization important for your organisation?

Please rate the importance of the following reasons from 'very high' to 'very low'

	Very high	High	Low	Very low
Verification of the declared inventory				
Improvement of characterization methods and techniques				
Operational safety				
Long term safety				
Economics (cost determination)				
Waste classification in view disposal choices				
Optimisation of disposal concepts				
Stakeholder involvement				
Regulatory requirements				
Long term monitoring				
Retrievability				
Communication				
Documentation				
QM & incident management				
Other:				

Comments (if any):

Q18. In your opinion, what lessons can be drawn from the waste characterization processes in your country?

Open comments

2.4 Guidance for answering the questions

Q1. What types of radioactive waste, including spent fuel, are managed by your organization?

- please specify the origins and the types of the waste you are managing

- you can adapt the table with waste classification according to the IAEA General Safety Guide No. GSG 1 to account for the classification scheme applied in your organisation/ country

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Q2. What is the option for storage / disposal of the radioactive waste and spent fuel in your country?

- please specify the storage / disposal option for each waste category identified in Q1

- please specify the existing or planned facilities for radioactive waste storage and disposal in your country

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Q3. What are the waste acceptance criteria (WAC) for the storage / disposal facilities identified above in Q2 (operational and foreseen to be commenced in the future)?

- for each storage / disposal option please include the main parameters that have to be characterized:

- *Radiological parameters*

- *Chemical parameters*

- *Mechanical parameters*

- *Other type of parameters (i.e. homogeneity, types of conditioning matrices, specifications for the container, waste accepted with restriction, forbidden waste, etc.)*

Q4. Should WAC be harmonized across Europe? If so, how?

- please express your personal point of view regarding the opportunity for WAC harmonisation

- if you consider this harmonization as opportune, please you express your personal idea on how this can be done

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Q5. How do you deal with the fact that the WAC as well as the final disposal concepts are in constant evolution (techno-scientific progress, experiences, stricter attitudes …)?

- how do you deal with the historical waste

- do you have to characterize more (as required by the current WAC?)

Q6. What methods are you applying in characterisation of conditioned radioactive waste?

- please specify and give as much details as possible on the methods applied in your organization for radioactive waste characterisation (including characterisation of waste before its conditioning)

- please specify how you correlate the so-called difficult to measure radionuclides with easy to measure nuclides

- please specify if you correlate the chemo-toxicity with radio-toxicity of the waste

- if you are complementing the measurement data with modeling/calculations, please specify and describe them specifying, if any, potential needs of codes' validation by National Control Authority

Q7. What are the uncertainties associated to the methods you are currently using in radioactive waste characterisation?

- please specify the levels of uncertainties for each method used in your radioactive waste characterisation

- please specify the target level of uncertainties

- what is the source of the uncertainty?

- please specify your action(s) (if any) to decrease the uncertainty level in characterisation of conditioned radioactive waste

Q8. Which other uncertainties (e.g. technical, conceptual, social, political, ethical) do you anticipate with regard to waste characterisation for safe disposal? Please list the three in your opinion most important ones. How do you deal with these uncertainties? Can they be managed?

Uncertainties may relate to changes in the final disposal concept, regulation and/or policy, divisions of responsibilities, limits of knowledge, amounts of waste, societal incentives or pressures, financial constraints, safety/security protocols, among others.

For all three of the uncertainties you mention, can you please tell us:

- what is the impact of each of these uncertainties on waste characterization is according to you (e.g. on the relationship between actors, operational safety, costs, …)

- whether and how these uncertainties are dealt with at present(e.g. through various procedures, leaving the option of re-characterization, storing the waste in a certain manner, …)

- any suggestions you may have on whether and how these uncertainties could be managed (e.g. new equipment, a political decision, involving other disciplines, reconditioning, flexible tariffs …)

Q9. Do you have in your country / organisation waste categories *and/or waste forms* that do not have a dedicated option for disposal? If yes, are you characterising them?

- if you identified waste that do not have dedicated option for storage/disposal, please specify what are these waste categories

- please identify what are the potential limits for the acceptance of these waste categories in the existing or future disposal facilities

- please specify what are the plans for managing these waste categories

- if you are characterising these waste categories/forms, please specify what kind of measurements are you performing

Q10. What are the major technical difficulties you encounter in characterising your conditioned radioactive waste?

- first please specify what are the conditioning methodologies and/or matrices used in your organisation

- please specify here any technical problems you face in the characterization process

Q11. What are the R&D needs that could solve the difficulties identified in Q10?

- please identify what techniques/methods could complement the ones already used in your organisation/country to improve the level of radioactive waste characterisation?

Q12. Do you have an active R&D programme on radioactive waste characterisation?

- if yes, please specify what are the main topics addressed

- are you interested to be involved in R&D projects related to radioactive waste characterisation?

Q13. The CHANCE project will address and develop some specific techniques: Calorimetry, Muon Tomography and Cavity Ring-Down Spectroscopy (for details see www.chance-h2020.eu).

Do you foresee an application of one of these techniques in your radioactive waste characterisation?

- if yes, please specify for what type of waste you could use these methods and how these methods improve the characterisation of your conditioned radioactive waste

Q14. In your country, who is in charge of characterization and who is in charge of control?

- what organisation(s) are responsible for radioactive waste characterisation

- what organization is in charge with control

- how the characterisation and control processes are structured

- how these processes are follow up

Q15. What is the role of host communities in these processes?

- Do host communities (i.e. the local community where the waste is stored / (will be) disposed) have a role in waste characterization and/or control in your country?

- Should these communities have a role in waste characterization and/or control in your opinion and if so which one?

- How do you deal with the concerns of local communities, e.g. concerns about the content of the disposal facility?

- Do you think that continuous improvement of waste characterization by innovative methods can improve the perception of risk associated with waste disposal?

Q16. Which disciplines / fields of expertise / actors are involved in the characterization of conditioned waste in your country? Are there any missing in your opinion?

please specify:
- *disciplines, fields of expertise and actors involved in radioactive waste characterization*
- *missing ones, if any*

Q17. Why is waste characterization important for your organisation?
Please rate the importance of the following reasons from 'very high' to 'very low'

	Very high	High	Low	Very low
Verification of the declared inventory				
Improvement of characterization methods and techniques				
Operational safety				
Long term safety				
Economics (cost determination)				
Waste classification in view of disposal choices				
Optimisation of disposal concepts				
Stakeholder involvement				
Regulatory requirements				
Long term monitoring				
Retrievability				
Communication				
Documentation				
QM & incident management				
Other:				

Comments (if any):

Q18. What lessons can be drawn from the waste characterization processes in your country?

Lessons can be either positive or negative.
You can compare with other countries, but this is not necessary.

Open comments

If you have some comments either on CHANCE project or on this questionnaire that have not been addressed previously, please mention them here.

3. Exploitation of the questionnaire results

The questionnaire will be distributed to the members of End-Users Group through the CHANCE website and specific mailing and through the IGD-TP network to collate information on national waste management programmes (radioactive waste streams and their management solutions) in order to define:

- Existing and planned disposal solutions for radioactive waste;
- Waste acceptance specification for each solution (including potential free-release);
- Technologies used for conditioned radioactive waste characterization;
- Potential on-going R&D programme on the topic of conditioned radioactive waste characterization;
- Interest on R&D actions included in CHANCE WP3, WP4 & WP5.

The questionnaire responses will be analysed in order to:

- Identify key parameters that need characterization;
- Identify technologies commonly used for conditioned waste characterization;
- Identify specific problematic issues for conditioned radioactive waste characterization.

On the basis of this analysis, a synthesis of commonly used methodologies for conditioned radioactive waste characterization will be presented at month 21 (February 2019) in Deliverable D2.2 "*Synthesis of commonly used methodology for conditioned radioactive characterization*". This deliverable will include a synthesis of end-users requirements and methodology and it will be reviewed by the members of EUG.