PSI Center for Nuclear Engineering and Sciences

eurad 2
European Partnership on Radioactive Waste Management

WP.17, TASK 5

"Loading curves, ILW mass limits and optimization"

Kick-off meeting

Co-funded by the European Union under Grant Agreement n° 101166718

SUMMARY

- General information
- Objectives
- Task efforts
- Description of activities (with deliverables)
- List of deliverables and Milestones
- Questions for today's meeting

GENERAL INFORMATION

- **Project start: October 1st, 2024**
- **Duration**
  - Total: 60 months (5 years)
  - First phase Approved 24 months (2 years)
  - Second phase To be approved
- **Implication: ratio of 0.4 applied to all PMs from the Grant Agreement (24/60=0.4)**
- **Task 5 leader: PSI (Dimitri Rochman)**
- **Task 5 co-leader: PURAM (Peter Buday)**
- **Start: month 1**
- **End: month 60**
- **Effort:**
  - EU countries: 72 PM (5 years) 28.8 PM (2 years)
  - Associated countries (CH and UK) 27.75 PM (5 years)
  - SNL and PNNL (USA) 2 PM (5 years)

GENERAL INFORMATION

Task 5 partners

- **Subtask 5.1:**

ANDRA (A. Feuerle)

VTT (P. Juutilainen, S. Häkkinen)

GRS (F. Sommer, R. Kilger)

CIEMAT (F. Álvarez)

CVUT (J. Frýbort)

ENRESA (F. Gómez)

JSI (M. Kromar)

LEI (A. Šmaižys)

PURAM (P. Buday, K. Aradi)

SKB (F. Johansson, A. Alvestav)

Tractebel (M. Vanderhaegen)

SSTC NRS (Y. Kovbasenko, Y. Hontar, O. Soloviov, K. Fuzik)

BGE (A. Göbel, F. Voigts, C. Herold)

GSL (T. Hicks, T. Baldwin, C. Elridge, N. Al-Abidah)

Nagra (V. Solans, S. Pudollek, M. Wittel)

PSI (D. Rochman, A. Vasiliev, M. Frankl)

SNL (L. Price)

PNNL (J. Clarity)

NWS (T. Harris, L. Payne)

Jacobs/Amentum (J. Roberts, E. Wilson, V. Ballard, R. Mason)

GENERAL INFORMATION

Task 5 partners

- **Subtask 5.2:**

ANDRA (A. Feuerle)

VTT (P. Juutilainen, S. Häkkinen)

GRS (F. Sommer, R. Kilger)

CIEMAT (F. Álvarez)

CVUT (J. Frýbort)

ENRESA (F. Gómez)

JSI (M. Kromar)

LEI (A. Šmaižys)

PURAM (P. Buday, K. Aradi)

SKB (F. Johansson, A. Alvestav)

Tractebel (M. Vanderhaegen)

SSTC NRS (Y. Kovbasenko, Y. Hontar, O. Soloviov, K. Fuzik)

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SNL (L. Price)

PNNL (J. Clarity)

NWS (T. Harris, L. Payne)

Jacobs/Amentum (J. Roberts, E. Wilson, V. Ballard, R. Mason)

GENERAL INFORMATION

Task 5 partners

- **Subtask 5.3:**

ANDRA (A. Feuerle)

VTT (P. Juutilainen, S. Häkkinen)

GRS (F. Sommer, R. Kilger)

CIEMAT (F. Álvarez)

CVUT (J. Frýbort)

ENRESA (F. Gómez)

JSI (M. Kromar)

LEI (A. Šmaižys)

PURAM (P. Buday, K. Aradi)

SKB (F. Johansson, A. Alvestav)

Tractebel (M. Vanderhaegen)

SSTC NRS (Y. Kovbasenko, Y. Hontar, O. Soloviov, K. Fuzik)

BGE (A. Göbel, F. Voigts, C. Herold)

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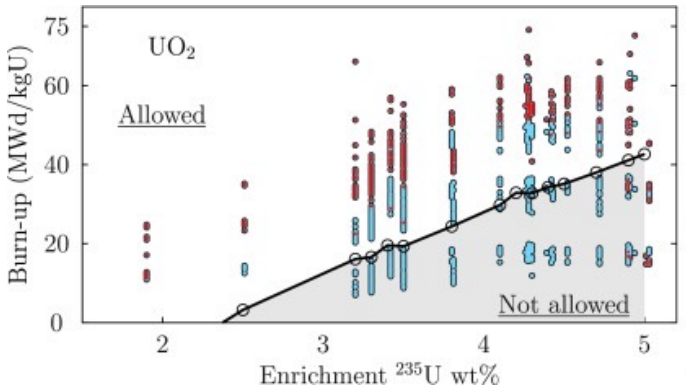
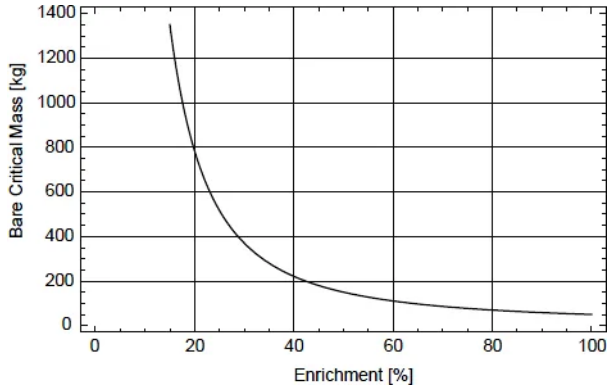
NWS (T. Harris, L. Payne)

Jacobs/Amentum (J. Roberts, E. Wilson, V. Ballard, R. Mason)

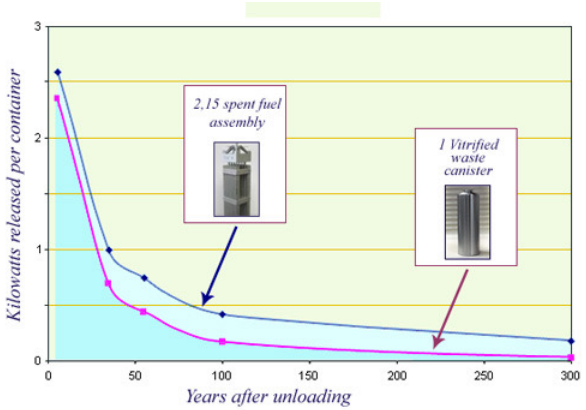
OBJECTIVES

- **Task 5: Development of methodologies for the « assessment of post-closure criticality scenario »**
  1. **Improve the modelling understanding for the development of**
     1. **« loading curves » and**
     2. **ILW mass limits**





  2. **Study the optimization of canisters, ILW packages and engineered barrier designs**
     1. **Decay heat**
     2. **Criticality**



https://radioactivity.eu.com/articles/radioactive_waste/spent_fuel_heat

TASK 5 EFFORTS

- **For EU countries: a total of 28.8 PM are assigned for the first 2 years**
  - See the emails sent by me to subtask participants on October 18.
  - Number of PMs decided for each institute, **but not** the distribution in subtask (to be decided by us)

- **For non-EU associated countries: 27.75 PM are assigned for the first 2 years**
  - See the emails sent by me to subtask participants on October 18.
  - Number of PMs decided for each institute, **and** a distribution in subtask is given in the Grant Agreement

- **For US (SNL and PNNL): 2 PM are assigned**
  - See the emails sent by me to subtask participants on October 18.
  - Number of PMs decided for each institute, **but not** the distribution in subtask (to be decided by us)

TASK 5 EFFORTS

Brief description (to trigger later discussions and brain storming)

- **Subtask 5.1**
  - Loading curves
- **Subtask 5.2**
  - ILW fissile mass limits
- **Subtask 5.3**
  - Optimization

Some details to be discussed today

TASK 5 DELIVERABLES AND MILESTONES

No deliverables and milestones within the task 5, but

- **Participation in D1 (lead by ANDRA) SOTA**
- **Participation in D2 (lead by SKB) Gap analysis**
- **Possibly other ones**

QUESTIONS FOR TODAY'S MEETING

How to organize the subtasks ?

- Different goals/interests from participants (based on survey by email, see next slide)
- See proposal on next slides
- (subtask leader, focussing on specific subjects) ?

How to present Task 5 results ?

- Conference contributions (which ones)
- Journal papers (which subject)

ANSWERS TO EMAIL'S QUESTIONS

Partner number	Organisation	subtask	Comments
1	ANDRA	5.1	2nd Priority: how we derive waste acceptance criteria for SF
		5.2	1st Priority. support:, provide information
		5.3	2nd Priority: suport: implication of "optimisation" for scenarios
2	VTT	5.1	1st Priority. Model comparison, but no model development.
3	GRS	5.1	1st Priority
		5.2	2nd Priority
		5.3	3rd Priority
4	CIEMAT	5.1	1st Priority: Optimization gallery space/length
		5.2	2nd Priority: Start the work on ILW (not considered until now)
5	CVUT	5.1	1st Priority: CS assemssment for VVER fuel
6	ENRESA	5.1	1st Priority: Review of the method of LC ; Technical: sensitvity
		5.2	Waste from dismanteling
7	JSI	5.1, 5.2	Technical work, CS fuel from Krsko
8	LEI	5.1, 5.2, 5.3	review and technical work, following task 4
9	PURAM	5.1, 5.2	Lead, review and technical work
10	SKB	5.1	1st Priority: LC, Share info and perform tehcnical work
11	Tractebel	5.1, 5.3	Share knowledge: depletion analysis + technical work
12	SSTC NRS	5.1, 5.2	Understanding approach and method
		5.3	Prepareation of the future
13	BGE	5.1	Technical: LC
		5.2	Technical: mass limit derivation
14	NWS	5.1, 5.3	Support
		5.2	
15	GSL	5.1	Review how WMO derive LC
		5.2	Review of the UK approach
		5.3	To be seen
16	Jacobs /Amentum	5.1, 5.3	Support
		5.2	
17	Nagra	5.1, 5.3	
18	PSI	5.1	Lead, review and technical work
19	Sandia Labs.		
20	PNNL	5.1	

<u>Different interests and proposals</u>

- Technical work
- Review of methods
- Support

<u>Need to find a common approach</u>

- LC derivation
- Canister sensitivity/optimization
- ILW mass limits

PROPOSED PLAN, TO BE DISCUSSED

Given the diversity of interest, the following logical approach to the subtask is proposed:

For subtasks 5.1 and 5.3:

1.	Start from an existing canister model (e.g. WPNCS SG13)	month 6 (March 2025)
2.	Perform a sensitivity study for criticality (e.g., dimensions, materials, impurities)	months 7-12 (April-Sept. 2025)
3.	Update the canister model definition and report	months 13-15 (Oct-Dec. 2025)
4.	Perform loading curve calculations (e.g. following the WPNCS SG13 approach)	months 16-28 (Jan.-Dec 2026)
5.	Report	

For subtasks 5.2:

1. Possibly to be done next
2. Or do it in parallel by different partners

GOAL OF TODAY'S MEETING

- Review the presented plan
- Possibly adjust
- Agree or propose a new plan
- Different ideas ?