

Make it Our Shared Wicked Problems! The « Pathways Evolution Process » Serious Game as Challenger for RWM strategies

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Starting point of the reflection in Belgium

Advanced Research but Lagging policy (Schroder, Laes and Bergmans 2015).

Death and [lack of] succession among nuclear waste experts (e.g Lamenti 2017)

Mainly disinterests of (future) stakeholders (e.g. Parotte and Fallon 2020) **and the refusal of participation** (Wynne 2007)



**NOBODY CARES,
WORK HARDER.**



First challenge: creating awareness, concerns and debates



SITEX . Network

Sustainable network for Independent Technical
EXpertise on radioactive waste management

NEWS AND EVENTS



2016

- Origin of the Pathways Evolution Process (PEP) serious game ©Sitex
- First application at **European Level** (RSE, FANC, Mutadis 2016,38p.)
- **32 participants** (Ibid, p.30-31)
- Context: Sitex II project

2019

- Declination of PEP serious game ©Sitex
- Application at **national level (France)** (Magazine repères n°43, IRSN, p. 20)
- **40 participants** (Sitex, 2021, p.16)
- Context: National public Debate

2021

- Declination of PEP serious game ©Sitex
- Application at **national level (Belgium)** (Parotte et al. forthcoming)
- **88 participants**
- Context: Academic

– 4S Toronto Good Governance, Good Relations and NWM III, October 8, 2021, virtual



Objectives of the serious game

Pathway Evolution Process =

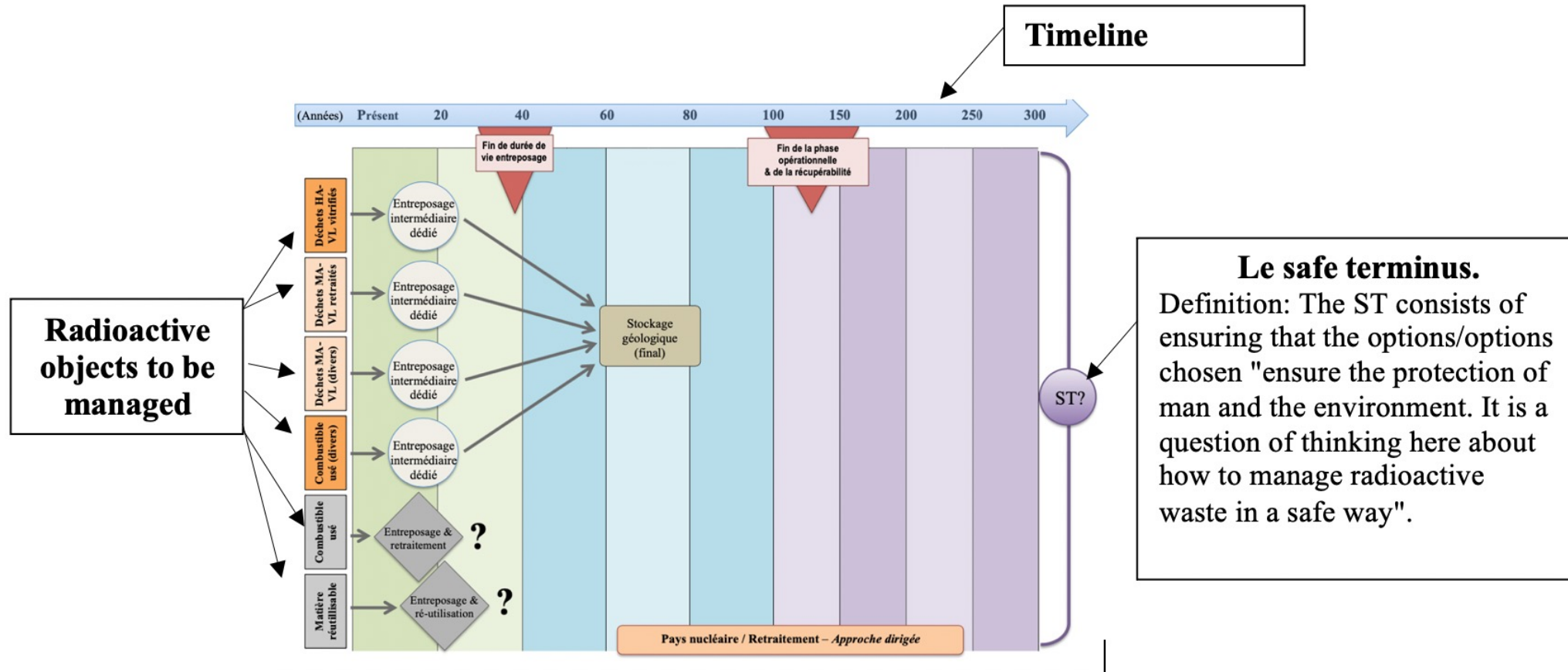
« exploring possible futures of long-term management of high-level and long-lived radioactive waste > 1,000,000 years »

(AFCN, 2021)



Photo: Parotte - formation of Pep Serious game, Liège, 2021

What is the Pathways Evolution Process serious game?



©Sitex Board game – **driven approach** with geological disposal option

Two game cards to be drawn

- **Unexpected problems cards that are imposed on the player:**
 - decisional challenges
 - disruptive events
 - unplanned changes
- **Evaluation cards: how to evaluate the problem? On what criteria?**



Photo: Uliege/AFCN - Pep Serious game, Liège, 24/4/2021



Bouleversement politique

Un changement politique majeur affecte le processus de décision.

- Ex:
- *La séparation du pays compromet la stratégie de GDR.*
 - *Durant une guerre civile, les sites d'entreposage existants tombent aux mains des séparatistes.*
 - *Un pays voisin obtient qu'une installation soit fermée/déplacée.*

Example of unexpected challenge ©sitex

???

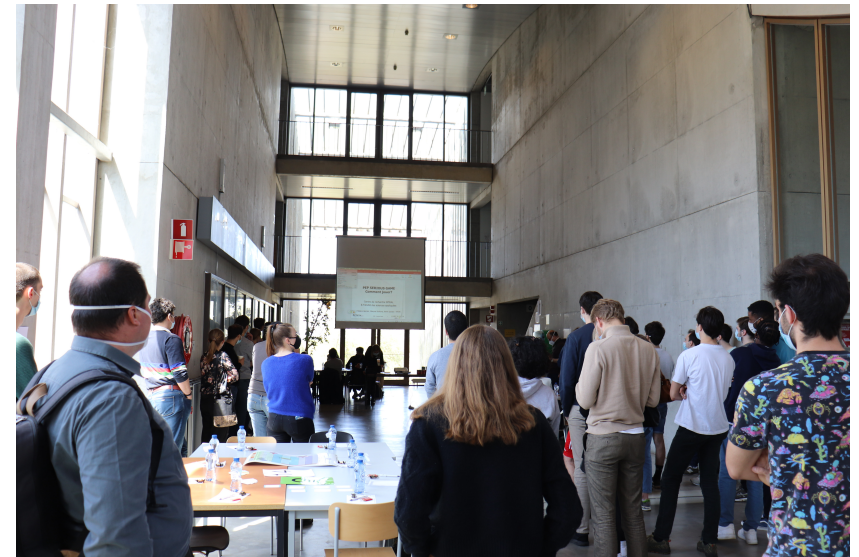
Surveillance

Quels seraient les enjeux clés des activités de surveillance pour le pathway ?

Example of evaluation card ©sitex

The Pep serious game in Belgium

- *Before*: 2 training sessions for facilitators (March & April)
- **16 game sessions** (April 24th)
- **88 young participants-gamers** from engineering and political science.
- **2 short technical presentations** to introduce the game
- **13 political scientists and engineers** to facilitate
- **5 nuclear regulatory body experts** to answer sociotechnical questions.
- **17 debriefings** with gamers



Lessons learned: on the method with facilitators

Photo: Uliege/AFCN - Pep Serious game, Liège, 24/4/2021

Performative effects on learning by doing

1. *Facing common uncertainties:*

- ***Drawing lots*** for the "unexpected events" cards.
- ***Facing strong constraints*** with the use of the driven board game first.

2. *Containing the expert interventions:*

- Multidisciplinary facilitation.
- Experts as outsiders of the game board.





Lessons learned with young gamers

I. Power to **create awareness** on NWM

- “So, there is a consensus to say **"let's take this issue on."** It is perhaps a very nice conclusion to this morning after all (Table 2).
- “what's great about this game is that you can run it **with any type of person, from any type of background or sector** around the table” (Table 4).
- “Because we realize that the subject **is topical** and will continue to be so in the years to come, it is a bit worrying (...)” (table 9)
- “We realize that **there is already waste...** it makes us more aware” (Table 10)
- “It makes us aware that there are many **different dimensions** to decision making” (Table 11)



Lessons learned with young gamers

2. Uneasy to deal with NWM complexities and uncertainties

Related to the game: “Cards are sometimes too technical” (table 5), what does it mean “non-retrievability”(table 8), “ontological” (table 13)? “Sometimes the cards are too focused on geological disposal” (table 5)

Related to the issue:

- "The only thing to remember today: there is **no quick fix**" (Table 4)
- "It made us realize **how difficult it is to project into the future**, in terms of taking positions" (Table 11)
- "It shows us that there are actually **an infinite number of possible scenarios** in time and it's just almost **impossible to predict and prepare** for them, so there will always be problems" (Table 11)



Lessons learned with young gamers

3. Deciding with or without the experts is a challenge!

Related to their own knowledge:

- “we were thrown in the deep end without prior knowledge” (table 10)
- “It requires decisions to be made over long periods of time, where we have very little knowledge” (table 11).
- “(...) I have the impression that if we are to try to find alternatives, we must know what already exists” (table 14)
- “you need knowledge or at least an expert at your table” (table 12)

Related to the expert knowledge and their interventions:

- “What was complicated, at least for us, was this **asymmetry of information between you, who are quite expert in nuclear energy**, and us, who don't know anything about it” (table 12)



Lessons learned with young gamers

4. In such context, **what are they asking for?** (*analysis in progress*)

- *Assessments : cost-benefice analysis, financial assessment, risk assessment and participation assessment.*
- *Financing questions and management*
- *Facing governance challenges: continuity, centralized or decentralized decision process, key roles for experts, rigid or flexible planning, actions before discussion, publics exclusion or inclusion*
- *Organizing memory of the object*
- *Imagining one or more (shared) solution(s) to ensure the safety terminus: geological disposal and other alternatives (the moon, eternal storage, transmutation, unknown solutions), the flexibility, the retrievability, the risks.*

– 4S Toronto Good Governance, Good Relations and NWM III, October 8, 2021, virtual



Photo: Uliege/AFCN - Pep Serious game, Liège, 24/4/2021

Conclusion: Pep serious game as challenger for RWM?

I. The "playing part" of the game as Challenger of the usual NWM framings:

- Uncertainties and unexpected events as business-as-usual.
- "Let's keep going to play": Collective decision have to be taken no matter what:
 - with(out) all scientific, technical and societal knowledge available.
 - with more questions than answers



Photo: Uliege/AFCN - Pep Serious game, Liège, 24/4/2021

Conclusion: Pep serious game as challenger for RWM?

2. The “serious” part of the game as an reproduction of hierarchy among knowledge that matter in RWM?

- Creation of a *limited* dialogical space.
- Shared responsibilities or double organized irresponsibilities?



Photo: Uliege/AFCN - Pep Serious game, Liège, 24/4/2021



Thanks for your attention

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