Supplement of Saf. Nucl. Waste Disposal, 2, 267–267, 2023
https://doi.org/10.5194/sand-2-267-2023-supplement

SaND
Safety of Nuclear Waste Disposal
Open Access

Supplement of

Solving problems collectively in nuclear waste governance

Stefanie Enderle and Elske Bechthold

Correspondence to: Stefanie Enderle (stefanie.enderle@kit.edu)

Institute for Technology Assessment and Systems Analysis

Karlsruhe Institute of Technology

TRANSENS

TRANSDISZIPLINÄRE FORSCHUNG ZUR ENTSORGUNG HOCHRADIOAKTIVER ABFÄLLE IN DEUTSCHLAND

Solving problems collectively in nuclear waste governance

Stefanie Enderle and Elske Bechthold

safeND 2023, Berlin, 13th September 2023

Session 18 ”Legal bases for safety related decisions and governance aspects in international comparison”

WHO WE ARE AND WHAT WE WOULD LIKE TO CONTRIBUTE TO THIS SESSION

Transdisciplinary research on the management of high-level radioactive waste in Germany (TRANSENS)

TRANSENS

Nuclear waste Governance

Nuclear waste management as a socio-technical project

TRANSDISCIPLINARY WORKSHOP

Method

- Design Thinking (Pearce 2020)

Participants

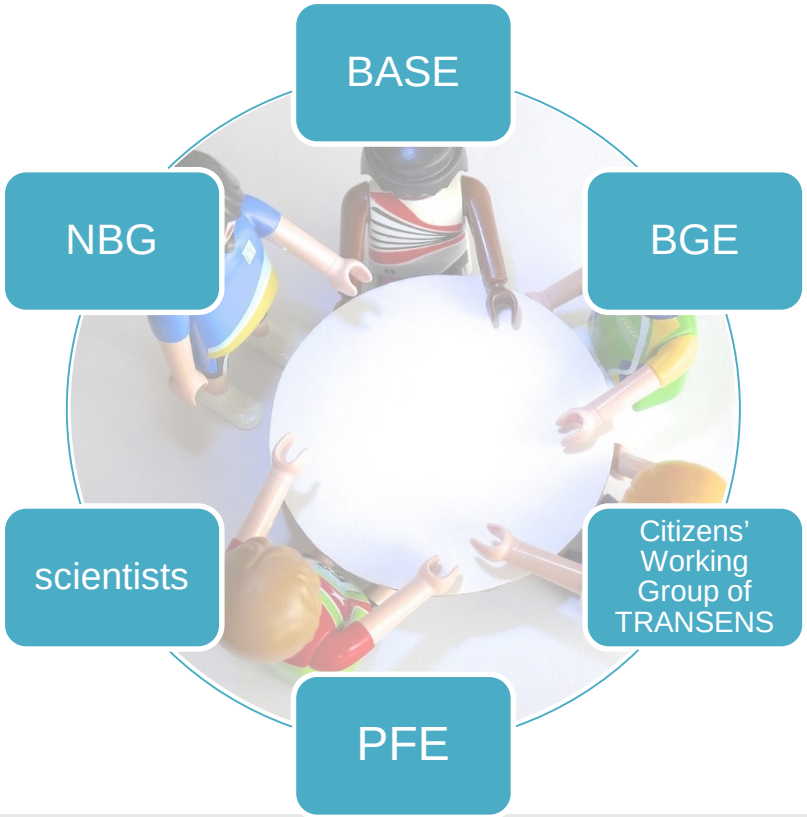
- 12 „Insider“

Approach

- develop common understanding of problem
- develop concrete solutions

Goal

- Trust-building framework to develop a collaborative solution



WHAT THEMATIC FRAMEWORK DID WE SET AND WHAT GOAL DID WE PURSUE?

Framework

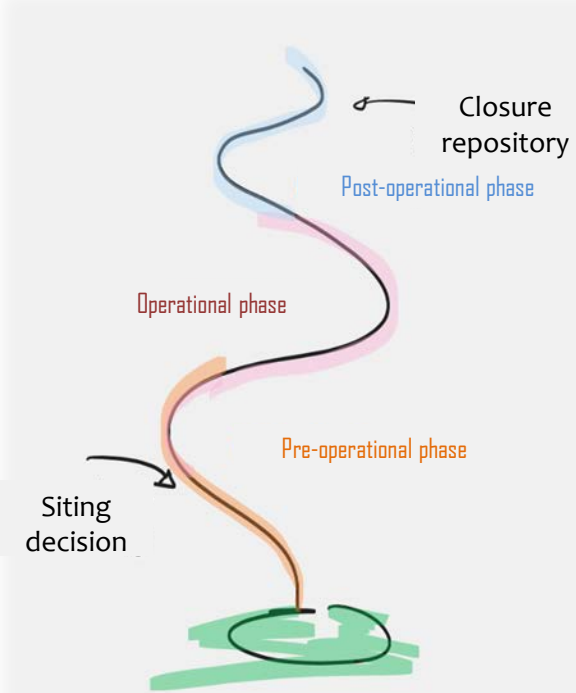
- Deep geological repository
- Site selection act (StandAG) with the attributes 'science-based', 'participatory', 'transparent', 'self-questioning' and 'learning'

Focus

- On the entire disposal path (c.f. Scheer et al. 2023)
- Into the further future

Goal

- Thinking in Alternatives (Grunwald 2019)
- Decisions, Challenges, Problems…



RELATIONSHIP BETWEEN „FUTURE“ AND „SAFETY“ (1)

Future-proof solutions should

- Promote safety,
- Keeping the time factor in view
- and, through transparent procedures
- flexible and binding
- to arrive at viable decisions

Observation

- "safety" refers to an superior goal
- But no further differentiation of the meaning

RELATIONSHIP BETWEEN „FUTURE“ AND „SAFETY“ (2)

A disposal path is future-proof

- goal-oriented ("leads safely to the goal"),
- safer,
- is science-based

Aspects included

- Trust-building
- avoidance of regressions
- not deferrable

Observation

- safety as a variable to be increased (“safer”)

INTERIM CONCLUSION

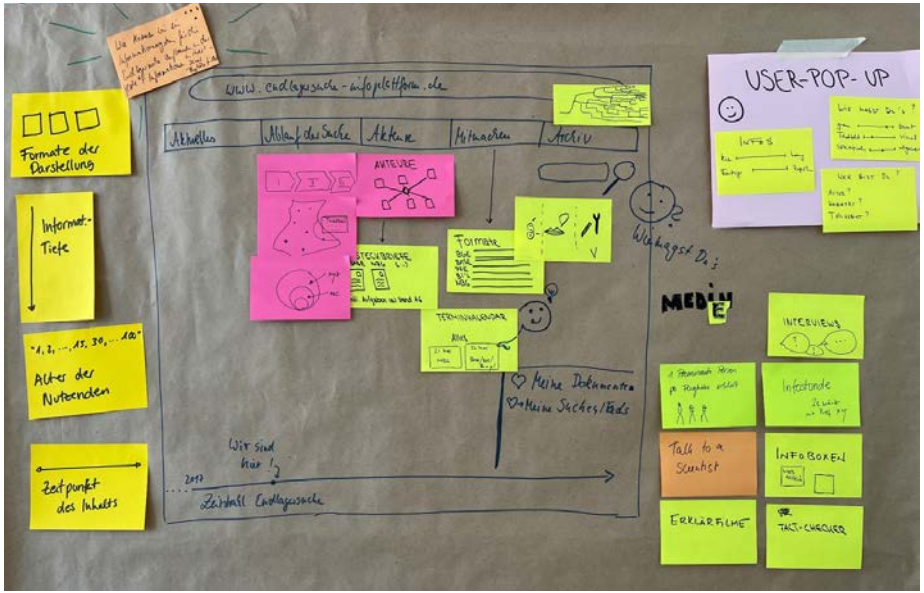
1. Safety as a term is suitable to describe a superior goal.
2. Safety is something to be achieved.
3. Other goals are compatible with standards from the Site Selection Act: science-based, transparent.
4. Other relevant topics: Trust, flexibility, the factor time

WHAT PROBLEMS HAVE BEEN IDENTIFIED? (1)

Central topic: Communication

- Tension between science-based and transparent and participative
- Improvement of communication between stakeholders, science and public
- Scientific topics must be understandable, accessible, structured but not highly simplified

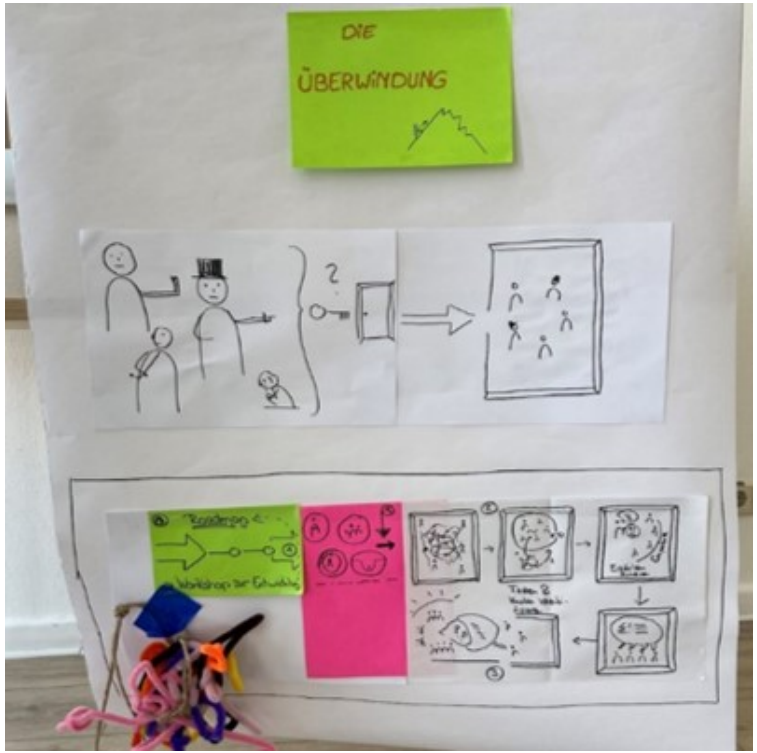
WHAT PROBLEMS HAVE BEEN IDENTIFIED? (2)



Information platform

- Revision of the information platform „Repository Search“
- Pluralistic approach, interactive communication
- Displaying of scientific results in different levels of language and comprehension

WHAT PROBLEMS HAVE BEEN IDENTIFIED? (3)



Central topic: Conflicts

- „The Overcoming“ – format for a protected space
- Past experiences burden the present
- Generational issue: conflict resolution is important to avoid disruptions and delays
- Formats for conflict management are necessary
- Improvement of the collaborative relationships between stakeholders

INSIGHTS FROM THE WORKSHOP

1

Current problems predominate

- Future thinking was not possible because of the present problems

2

Strong status quo orientation

- StandAG as a given legal framework → challenges „thinking outside the box“

3

Communication and conflicts as central problem areas

- Improvement of collaborative relations as ‚conditions for success’ in the Site selection procedure

INSIGHTS FROM THE WORKSHOP

1. **Current problems predominate**
   - Future thinking was not possible because of the present problems
2. **Strong status quo orientation**
   - StandAG as a given legal framework → challenges „thinking outside the box“
3. **Communication and conflicts as central problem areas**
   - Improvement of collaborative relations as conditions for success for the Site selection procedure

➡ „Safety“ as a shared goal

WHAT IS THE IMPORTANCE OF THE ‘PRIMACY OF SAFETY’?

‚Primacy of safety‘ (cf. German Commission on the Storage of High-Level Radioactive (Endko), StandAG §1) is recognized and shared

All decisions to be made must always take safety into account

Dominance of technical-engineering understanding of safety?

WHY AN EXPANDED UNDERSTANDING OF SAFETY?

"Safety should be understood as a construct that is not provided by technical solutions alone, but arises in interaction with human actions" (Brunnengräber et al. 2021).

Nuclear waste disposal as a socio-technical system

Geoscientific and engineering approaches must be coordinated with social expectations and political action

To achieve the best possible (technical) safety, the procedure must be the best possible

Balance between the technical-engineering solution, required time and the quality of the decision-making process with public participation

SAFETY OF A FUNCTIONAL SOCIO-TECHNICAL SYSTEM

Resilient

- to have the ability to withstand disturbances
- respond to current changes, monitor critical situations, anticipate future events, learn from the past (cf. Röhlig/Sträter 2022)

Robust

- Stable Governance structures with options for flexible design

Collaboration

- between the institutions or beyond the institutions with the public
- Orientation towards cooperation and collaboration (Schimank 2000)

CONNECTING THE THEORETICAL CONSIDERATIONS WITH THE INSIGHTS FROM THE WORKSHOP

Resilient

- Need for "anticipating future events" and "learning from the past"

Robust

- Flexibility in public participation process was necessary (see e.g. Repository Search Forum)
- Adjustments should be discussed openly
- Status quo orientation could be an obstacle

Collaboration

- Protected spaces for conflict resolution
- Pluralistic and accessible communication channels
- Common goals (e.g. primacy of safety) help to establish collaborative forms of cooperation (c.f. Bechthold/Enderle 2023)

CONCLUSION

Socio-technical system of nuclear waste governance & safety means…

- paying attention to the aspects of resilience of the procedure,
- robustness of the structures and
- collaborative relationships.

Primacy of safety & expanded understanding of safety means…

- ensuring and strengthening problem-solving abilities and the capacity to act.
- This requires repeated approaches to challenge the actors involved to break out of their habitual patterns of action.

All safety-related considerations and decisions should…

- be made with an expanded understanding of safety in mind.
- be discussed not only within the scientific community, but with stakeholders and the public.

THANK YOU FOR YOUR ATTENTION!

Gefördert durch:

Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz

aufgrund eines Beschlusses des Deutschen Bundestages

Gefördert im Niedersächsischen Vorab der Volkswagenstiftung

VolkswagenStiftung

Niedersächsisches Ministerium für Wissenschaft und Kultur

Förderkennzeichen: 02E11849A-J

ITAS: 02E11849E

REFERENCES

Brunnengräber, A., Isidoro Losada, A. M., Brohmann, B., and Hocke, P.: Konzepte und Maßnahmen zum Umgang mit soziotechnischen Herausforderungen bei der Entsorgung radioaktiver Abfälle: Ein einleitender Beitrag, in: Robuste Langzeit-Governance bei der Endlagersuche: Soziotechnische Herausforderungen im Umgang mit hochradioaktiven Abfällen, edited by: Brohmann, B., Brunnengräber, A., Hocke, P., and Isidoro Losada, A.M., transcript (Edition Politik 115), Bielefeld, 11–22, https://doi.org/10.14361/9783839456682-002, 2021.

Grunwald, A.: Shaping the Present by Creating and Reflecting Futures, in: Socio-Technical Futures Shaping the Present. Technikzukünfte, Wissenschaft und Gesellschaft / Futures of Technology, Science and Society, edited by: Lösch, A., Grunwald, A., Meister, M., and Schulz-Schaeffer, I., Springer VS, Wiesbaden, 17-35, 2019.

Hocke, P., Kuppler, S., and Enderle, S.: Robuste Langzeit-Governance und Notwendigkeiten neuer Navigation. Zur Qualität soziotechnischer Gestaltungsprozesse. in: Robuste Langzeit-Governance bei der Endlagersuche: Soziotechnische Herausforderungen im Umgang mit hochradioaktiven Abfällen, edited by: Brohmann, B., Brunnengräber, A., Hocke, P., and Isidoro Losada, A.M., transcript (Edition Politik 115), Bielefeld, 363–385, https://doi.org/10.14361/9783839456682-017, 2021.

Pearce, B.: Design Thinking. An iterative methodology for (re)framing problems and co-creating implementable solutions using visual thinking and prototyping. td-net toolbox profile (11). Swiss Academies of Arts and Sciences: td-net toolbox for co-producing knowledge. www.transdisciplinarity.ch/toolbox. doi.org/10.5281/zenodo.3717021, 2020.

Röhlig K.-J., and Sträter O.: Das „lernende“ Verfahren – Ziele, Systemgrenzen, Akteure und Erfahrungen, in: Das „lernende“ Standortauswahlverfahren für ein Endlager radioaktiver Abfälle, edited by: Smeddinck U., Röhlig K.-J., Mbah M., and Brendler V., Berliner Wissenschafts-Verlag, Berlin, 29–41, https://doi.org/10.35998/9783830555124, 2022.

Scheer, D., Becker, F., Hassel, T., Hocke, P., Leusmann, T., and Metz, V.: Trittsicherheit auf Zukunftspfaden? Ungewissheitsbewältigung bei der Entsorgung hochradioaktiver Abfälle, in: Entscheidungen in die weite Zukunft, edited by: Eckhardt, E., Becker, F., Mintzlaff, V., Scheer, D., and Seidel, R, Springer Nature VS, Wiesbaden, in preparation, 2023.

StandAG (2017): Gesetz zur Suche und Auswahl eines Standortes für ein Endlager für hochradioaktive Abfälle (Standortauswahlgesetz -– StandAG). https://www.bmu.de/en/law/repository-site-selection-act-standag/, last access: 13.09.2023.

Werle, R., and Schimank, U.: Einleitung, in: Gesellschaftliche Komplexität und kollektive Handlungsfähigkeit, edited by: Werle, R., and Schimank, U., Campus, Frankfurt/Main, 9–20, 2000.