



Optimising the safety case through transdisciplinary research?

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Abstract. The primary goal of the management of radioactive waste is safety. On the disposal path leading to a repository for radioactive waste, safety cases for disposal facilities have an important function as a basis for management-related, licensing, and political decisions. In the German site selection process, the preliminary safety analyses play a central role: they must inform siting decisions at three important steps of the process.

Many stakeholders therefore have high expectations of these safety assessments. Past experiences suggest that their expectations are not always met by the current safety cases, which have grown historically, therefore follow internationally established conventions, and are extensive, complex, and difficult to comprehend.

Transdisciplinary research has the potential to provide the implementer, BGE (Federal Company for Radioactive Waste Disposal), the regulator, BASE (Federal Office for the Safety of Nuclear Waste Management), and other actors in waste management with valuable information for the design and review of safety analyses that better meet the expectations of different stakeholders and actors. It provides new impulses, opens up other perspectives on questions concerning the safety case, and introduces novel proposals for solutions. In this way, it contributes to robust safety assessments and a resilient safety of repositories for radioactive waste.

Based on tangible results from the research project TRANSENS (Transdisciplinary research on the management of high-level radioactive waste in Germany), we want to discuss how the safety case can be optimised in a transdisciplinary way. Topics that will be addressed in the workshop are the following.

- The design of a digital safety case. A digital safety case opens possibilities not only for improving the assessments of safety-relevant information, but also new perspectives on the cooperation of all those involved in the development of a safety case and their exchange with the interested public.
- Extensions of the features, events, and processes (FEP) catalogue. The FEP catalogue often gives rise to discussions with experts and the interested public. How can it be ensured that, as far as possible, all relevant information is covered and finds appropriate input into further activities (scenario development or modelling)? Here, digital and transdisciplinary methods offer new approaches to solutions.
- The benefits of extended peer communities. Extended peer communities can contribute to the quality, legitimacy, and acceptance of science-based documents such as safety cases. This finding from the social sciences can be applied well to the participatory, science-based, transparent, self-questioning, and learning site selection process. However, what about feasibility in practice?

At the same time, we will introduce and try out transdisciplinary methods and tools like Research Marketplace, Soft Systems Methodology or Rich Picture. Transdisciplinary research differs from other forms of social science research in its higher degree of openness to inputs from participants. Toolboxes offer a wide range of instruments that can be used to suit the research question at hand. The workshop therefore not only offers the opportunity to exchange ideas on topics concerning the safety case, but also to get experiences with transdisciplinary methods and tools first hand.

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