



Development of a method for the scenario-based identification of calculation models (EMS)

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Abstract. A key goal of final disposal is the safe confinement of the radioactive waste to protect people and the environment. In order to evaluate the safe confinement, inter alia the consideration and analysis of expected and deviating developments of the disposal system are required. The derivation and identification of potential safety-relevant developments is the task of scenario development. With regard to the safety assessment, the scenarios (developments) are to be treated within the framework of numerical model calculations. It is essential that the calculation cases cover the scenarios and comprehensively consider the essential developments.

The focus of the EMS (Entwicklung einer Methode zur szenariengestützten Identifizierung von Berechnungsmodellen) project (Beuth et al., 2021) is the development and testing of a method for the scenario-based identification of calculation models and the associated calculation cases. The main aspect of the method is an intensive, iterative exchange between the disciplines of scenario development and modeling, in which calculation cases are gradually optimized or adapted with a view to representativeness up to the required degree of scenario coverage.

The testing and further developing of the procedure shall help to identify difficulties in the development of scenario-based calculation cases. Transparency, traceability and possible gaps in justification for modeling decisions are also important issues.

Up to now, only little research has been done on the question of when a scenario is covered by calculation cases. Experience from safety analyses, e.g., the preliminary safety analysis for Gorleben (Fischer-Appelt et al., 2013), confirm that the derivation of calculation cases from scenarios is difficult. Therefore, one goal of this study is to assist the development of the derivation from calculation cases based on scenario development. The outcome of the EMS project is intended to support the Federal Office for the Safety of Nuclear Waste Management (BASE) within the framework of supervision and approval in the evaluation process of whether scenarios have been sufficiently covered by calculation cases.

References

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