**Integration Group for the Safety Case (IGSC) Symposium 2024***MOVING TOWARDS THE CONSTRUCTION OF A SAFE DGR – GETTING REAL*

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| **Abstract Title: The meanings of “safety”**  **Federal Office for the Safety of Nuclear Waste Management (BASE), Germany** [**stephan.hotzel@base.bund.de**](mailto:stephan.hotzel@base.bund.de) | |
| **Abstract (300-500 words):**  A striking disagreement between safety experts exists on the following question: Is any kind of societal effort after repository closure (e.g. societal memory preservation) related to the safety of the repository? Or in other words: Can repository safety be enhanced through memory preservation? While the disagreement may appear to show different views on memory preservation, we make a case for this example rather showing different perceptions of safety:  Safety #1: As a general concept, safety is not determined by the regulator. It is owned by society. Society uses the concept of safety, just like many other concepts, in everyday communication in a useful way – obviously without permanent problems or grave misunderstandings. In the context of a potentially dangerous object or procedure, the term *safety* means “the state of not being dangerous or likely to cause harm or injury: [For example:] Some scientists expressed concern over the safety of the test” (Longman Dictionary of Contemporary English, 1995). The concept of safety as such, i.e. in this general form, is labelled here as “safety #1”.  Safety #2a: If licensing is involved, the regulator comes into play as it must be stated, what level of “not dangerous” and what level of “not likely to cause harm or injury” is required for the object or procedure under consideration. In other words, the regulator or policy maker determines how safe is safe enough. We label this as “safety #2a”. In the radiological domain, this may be a dose limit. More generally and in principle, it could also be something like: *no injury exceeding light injury to be expected for any participant in the test*.  Safety #2b: Closely related to the issue of how safe is safe enough, is the issue of by which means the proof (that the object or process is, or will be, safe enough) can or should be provided, i.e. the kind of evidence that is required. We label this as “safety #2b”. These evidence-of-safety regulations (i.e. safety #2b) should match the level-of-safety standard (i.e. safety #2a), but they are not the same. For example, #2a may be based on societal ethical values, while #2b may require technical expertise. Also, while #2a may differ between different jurisdictions, safety #2b will also differ between different technical systems under consideration. Sometimes, #2a is not made explicit but instead included implicitly in #2b.  Considering the safety of a deep geological repository (DGR) after closure, the distinction between safety #1, safety #2a and safety #2b is possible, and it is useful. Certain difficulties in communication about DGR safety may originate in a mix-up of safety #1 with safety #2a/#2b, with one discussant discussing the former and the other the latter.  Coming back to the disputed question we have started with, whether societal efforts after closure can enhance the safety of a DGR: We think that negative statements, which can be found in the literature, may actually refer to safety #2b, while affirmative statements would fit to safety #1. | |