



Pluralistic view of human-related uncertainties and their management – outcome of the European Joint Programme on Radioactive Waste Management (EURAD) strategic study UMAN (Uncertainty Management multi-Actor Network)

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Received: 6 April 2023 – Accepted: 23 May 2023 – Published: 6 September 2023

Abstract. Management of uncertainties represents one of the components of a safety case for the disposal of radioactive waste. Depending on the role and interest of technical and non-technical actors involved in radioactive waste management programmes, the assessment of uncertainty significance for disposal safety and the preferable options for uncertainty treatment may vary among these actors. These possible differences, but also similarities, in uncertainty management were explored in the strategic study, Uncertainty Management multi-Actor Network (UMAN), which was initiated in June 2019, with a duration of 5 years, in the framework of the European Joint Programme on Radioactive Waste Management (EURAD). The following actor categories participated in this study: Waste Management Organisations (WMOs), Technical Support Organisations (TSOs), and Research Entities (REs), completed by specific interactions with Civil Society (CS) representatives, Regulators, and the Forum on Stakeholder Confidence (FSC) and Integration Group for the Safety Case (IGSC) of the Nuclear Energy Agency (NEA), who represented European Member States with different national radioactive waste programmes. The presentation will focus on the uncertainties associated with human aspects; however, in the study, several other types of uncertainties were also investigated, namely uncertainties associated with site and geosphere, spent nuclear fuel, waste inventory, and near field.

Based on the analysis of possible uncertainties related to human aspects, a questionnaire containing a list of the 10 most relevant uncertainties potentially significant for safety was developed for the purposes of the assessment of their significance for safety from the perspective of WMOs, TSOs, and REs. As a result of the analysis of the responses to this questionnaire, uncertainties associated with the following four topics were selected for the discussion of the possible and preferable management options: public acceptance of the repository at potentially suitable or projected locations, a schedule to be considered for implementing the different phases of the disposal programme, the adequacy of safety-related activities during construction for the implementation of safety provisions, and “new” knowledge.

Based on the identified strategies and options for the management of these uncertainties (i.e. from uncertainty identification up to specific measures to reduce, mitigate, and avoid uncertainty), two different exchange formats were adopted to develop a common understanding and assess different viewpoints among the actors with respect to management of the selected uncertainties. The aim of workshop, in which a smaller actor group consisting of WMOs, TSOs, and REs took part, was to identify management preferences within each actor category and then among all the participating actors, in addition to understanding the rationale behind them. A stepwise and iterative approach, regular stakeholder dialogue, and safety-oriented management processes were recognised as being the key elements of a sound uncertainty management strategy. In a subsequent seminar, a broader actor group, including the key actors (WMOs, TSOs, and REs), CS representatives, Regulators, and the FSC and IGSC of NEA, exchanged their viewpoints with respect to uncertainty management and on the robustness of the safety case in the presence of uncertainties, based on scenarios related to the four selected uncertainties. The outcome of the workshop and the seminar, namely the advantages but also challenges in a pluralistic approach to uncertainty management, will be discussed in the presentation.

Financial support. This research has been supported by the European Commission’s Euratom Research and Training Programme (grant no. 847593).