A European-scale Multi-Hazard Screening Process for the selection of decommissioned Nuclear Power Plants

Ann-Kathrin Edrich (1), James Daniell (2), Eric Haecker (1), Andreas Schaefer (2), and Friedemann Wenzel (2)

(1) Geophysical Institute, Karlsruhe Institute of Technology, (2) Center for Disaster Management and Risk Reduction Technology, Geophysical Institute, Karlsruhe Institute of Technology

In the course of the EU project NARSIS (New Approach to Reactor Safety ImprovementS), www.narsis.eu, sites of decommissioned nuclear power plants are investigated for their vulnerability to the occurrence of multiple natural hazards occurring at the same time among other analyses for theoretical nuclear sites.

As a first step, open European and national databases were searched for information on the most important natural hazards. These natural hazards are earthquakes, tsunamis, volcanic eruptions, floods, landslides, forest fires, droughts and extreme weather events. In addition to historical and recent events, already existing assessments of these hazards were also of interest such as the RAIN project for extreme weather, or SHARE-EU for earthquakes.

The data availability for historic events of certain peril types is often quite poor, while there is more open data available online on recent events. Already existing hazard assessments is accessible quite easily online.

In addition to the natural hazards, the characteristics, like the reactor type, of the various sites were also of relevance and thus were part of the screening process.

By bringing together the collected information, suitable and representative sites were selected to model the likelihood of the occurrence of various scenarios of combinations of two natural hazards at the same time at a site of a decommissioned nuclear power plant as well as the consequences of such an event. Initially, only a few sites were selected for test modelling where combinations of perils could occur.

The information that was obtained that way will, in the later stages of the NARSIS project, be used to analyse the effects of the occurrence of multiple hazards on nuclear power plants via combinations of hazard curves leading through to risk calculations.