RSK recommendation (442nd meeting on 17.11.2011)

RSK's understanding of the term robustness in the context of the EU stress test

The term "cliff edge effect" is understood as it is described in the IAEA standards:

A cliff edge effect, in a nuclear power plant, is an instance of severely abnormal plant behaviour caused by an abrupt transition from one plant status to another following a small deviation in a plant parameter, and thus a sudden large variation in plant conditions in response to a small variation in an input¹.

Robustness according to ENSREG shows the margins against cliff edge effects in the area that exceeds the design (robustness of the plant beyond its designs basis).

In this respect, it is to be shown in particular which safety margins are available before conditions occur where catastrophic impacts can no longer be excluded. Whether these margins will be sufficient or appropriate, i.e. sufficient robustness is proven, has then to be assessed by the respective regulators.

Here, the topics are to be considered which are specified in the EU stress test. These are defined events/hazard or also postulates.

Accident management measures and the use of emergency systems have also to be considered in the analyses. In this respect, a distinction must be drawn as to whether additional margins to prevent cliff edge effects are generated, or consequences after reaching cliff edge effects are mitigated.

The safety margins can be identified both on a deterministic and probabilistic basis.

¹ Draft Safety Requirements: Safety of Nuclear Power Plants: Design Revision of IAEA Safety Standards Series No. NS-R-1, 24 June 2011