Flood hazard assessment for french NPPs

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This paper presents the approach for flood hazard assessment for NPP which is on-going in France in the framework of post-Fukushima activities. These activities were initially defined considering both European "stress tests" of NPPs pursuant to the request of the European Council, and the French safety audit of civilian nuclear facilities in the light of the Fukushima Daiichi accident. The main actors in that process are the utility (EDF is, up to date, the unique NPP's operator in France), the regulatory authority (ASN) and its technical support organization (IRSN). This paper was prepared by IRSN, considering official positions of the other main actors in the current review process, it was not officially endorsed by them.

In France, flood hazard to be considered for design basis definition (for new NPPs and for existing NPPs in periodic safety reviews conducted every 10 years) was revised before Fukushima-Daichi accident, due to le Blayais NPP December 1999 experience (partial site flooding and loss of some safety classified systems).

The paper presents in the first part an overview of the revised guidance for design basis flood. In order to address design extension conditions (conditions that could result from natural events exceeding the design basis events), a set of flooding scenarios have been defined by adding margins on the scenarios that are considered for the design. Due to the diversity of phenomena to be considered for flooding hazard, the margin assessment is specific to each flooding scenario in terms of parameter to be penalized and of degree of variation of this parameter. The general approach to address design extension conditions is presented in the second part of the paper. The next parts present the approach for five flooding scenarios including design basis scenario and additional margin to define design extension scenarios.