

INSIGHTS INTO DIFFERENCES BETWEEN THE REQUIREMENTS OF THE ASME/ANS EXTERNAL EVENT PROBABILISTIC RISK ASSESSMENT STANDARD AND THE POST-FUKUSHIMA NRC 50.54(F) REQUEST FOR INFORMATION PROCESS FROM A SEISMIC HAZARD ANALYSIS PERSPECTIVE

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ABSTRACT

On March 12, 2012, the United States Nuclear Regulatory Commission (NRC) issued a 50.54(f) request for information letter to all operating Nuclear Power Plants (NPPs) owners. Enclosure 1 of that letter describes a multi-step process developed with the objective of ensuring and demonstrating seismic safety and risk for each operating NPP using analysis tools and methods consistent with licensing of new reactors.

The overall process, which was further clarified in Electric Power Research Institute Report 1025287 (general known as the “SPID”), started with a screening process that compared an updated estimate of ground motion to the design ground motion for each NPP site. For NPPs that “screened in,” a risk evaluation, generally in the form of a seismic probabilistic risk assessment (SPRA), is required. The NRC will use the SPRA results to determine what, if any, additional regulatory actions are appropriate.

Recently, confusion has arisen regarding the differences between the hazard information needed for the NRC’s screening process and the hazard inputs needed for the SPRAs being conducted, particularly in cases where the SPRAs are to be reviewed against the ASME/ANS external events risk assessment standard ASME/ANS RA-Sb–2013. Beyond the different needs of the two evaluations, confusion also results from the use of the regional source and ground motion characterization models endorsed by the NRC. Further, complications arise from the substantial changes in hazard assessment practice that have occurred since the publication of the current Standard.

This paper begins with a discussion of the general background relevant to the current hazard assessment challenges for the 50.54(f) activities. The paper then discusses the key supporting requirements of interest in the ASME/ANS Standard in relation to current needs and, where appropriate, discusses approaches for closing gaps between the needs of the 50.54(f) activities and SPRAs intended to meet the ASME/ANS Standard.

REFERENCES

- ASME/ANS (American Society of Mechanical Engineers/American Nuclear Society), (2013). “Addenda to ASME/ANS RA-S–2008 Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications,” Standard ASME/ANS RA-Sb–2013, American Nuclear Society.
- NRC (Nuclear Regulatory Commission), (2012). “Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3 and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident,”

Letter from E. Leeds and M. Johnson to All Power Reactor Licensees et al. issued March 12, 2012, U.S. Nuclear Regulatory Commission.