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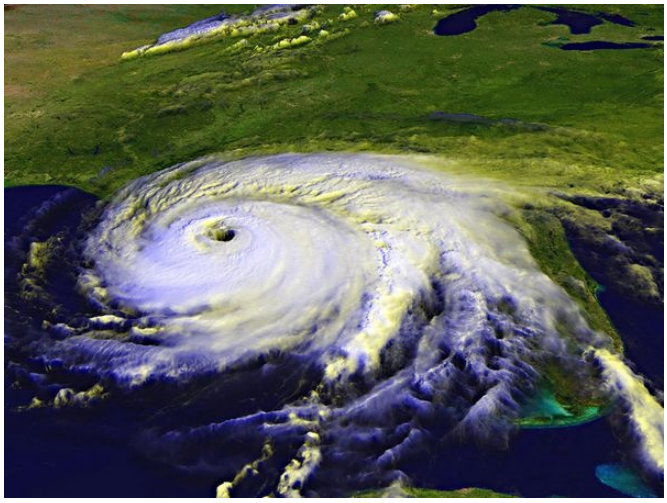
External Hazards: Information Compilation and Analysis



Detailed awareness of external hazards and their potential impacts on nuclear plants is necessary to properly inform decisions affecting safe plant operation. EPRI tracks evolving information related to such external hazards using a rigorous process. Benefits include:

- An efficient, shared resource for understanding changes in external hazards
- Regular reporting of relevant updates to inform decisions regarding preparations for external hazards
- Interpretation and analysis of information to identify technical insights and to clarify potential uncertainties

Background, Objectives, and New Learning

In the aftermath of the earthquake and tsunami that led to the accident at Fukushima Daiichi, increased attention has been paid to challenges that might be presented by external hazards. An important aspect of being adequately prepared for these challenges is the recognition that our understanding of the hazards, and indeed the nature of some of the hazards themselves, may evolve over time. Tracking information pertaining to external hazards on a continual or periodic basis can help facility owners fully account for external hazards and maintain the safe operation of nuclear power plants.

Benefits

Safe nuclear power plant operation is essential to their continued viability. This includes taking appropriate steps to protect against the possible effects of external hazards such as earthquakes and tornados. As understanding of the likelihood and potential severity of these hazards evolves, it is necessary to examine how these changes may affect plant design assumptions.

Regulators and utilities around the world are considering how nuclear plants should consider and evaluate potential new information related to external hazards. In the US, a recent Institute of Nuclear Power Operations (INPO) Event Report (IER) identified the need to evaluate the implications of new information on external hazards. The U.S. Nuclear Regulatory Commission's Near-Term Task Force separately offered the same recommendation. The hazards to be considered include:

- Seismic events
- External flooding (such as local intense precipitation; flooding from nearby rivers, lakes, and reservoirs; high tides; seiche; hurricane and storm surge; and tsunami events)
- Storms and storm-induced events (such as hurricanes, high winds, tornadoes, extreme straight winds, and tornado missiles)
- Extreme snow, ice, and cold (such as frost, ice cover, frazil ice, snow, extreme low temperatures)
- Extreme heat

The variety of information sources regarding external hazards can make it challenging to understand when relevant new information becomes available.

Through this project, EPRI develops processes and criteria to screen and evaluate potential new information related to external hazards. For US sites, EPRI tracks information sources for these five hazards, providing a central clearinghouse for data compilation and subsequent analysis. For participants outside of the US, EPRI will share processes, criteria,

operating experience and best practices in collaborative forums as the global nuclear community addresses these potential changes and new information related to external hazards.

Project Approach and Summary

To develop the inputs, EPRI has established processes and technical bases for the following major tasks:

1. Create a Catalog of Relevant Information Sources

   EPRI has established the sources of information to be tracked by developing a list of the relevant hazards and credible sources through a review of the design bases for operating U.S. nuclear power plants. The catalog of sources is monitored and updated as new information sources emerge.

2. Monitor Sources of Information on a Routine Basis

   Based on the catalog of credible and relevant sources for each type of hazard, updates to the information are tracked on a routine basis for participating US sites. EPRI will monitor these sources on a proactive basis and on a periodicity consistent with the manner in which the information is maintained. EPRI will also share its processes and criteria for performing routine monitoring with project participants outside of the US.

3. Report Updated Information to Individual Plant Owners

   On a routine basis, EPRI will report to owners of nuclear power plants operating in the U.S. any changes to the information that could affect understanding of the relevant external hazards. This information will be evaluated within the context of the INPO Event Report (IER) and limited to those events and sources of information deemed relevant and credible. The report will include general guidance to aid the plant owner in determining the relevance and significance of the new information to the individual plant site. It will be the responsibility of the plant owner, however, to process the information in accordance with industry guidance to conclude whether specific plant changes or other actions are needed.

   In unusual circumstances, new information may be identified that should be evaluated on a more timely basis. In such cases, EPRI will report this information directly to the affected plant owners as quickly as is feasible.

4. Share and Improve the External Hazards Monitoring Process through Global Collaboration

   Plants and regulators around the world are asking similar questions about how plants should monitor for and address potential changes to the understanding of external hazards that may impact nuclear plants. As part of this project, EPRI will share the processes, criteria, and lessons learned from applying the above process for participating US nuclear plants. To further support global collaboration, EPRI will share best practices, process improvements, and technical bases associated with the monitoring and evaluation of potential new information related to external hazards.

Deliverables

The deliverables for this project will include:

- Published descriptions of the processes and criteria established to monitor external hazards for participating US nuclear sites.
- Periodic reports documenting the credible and relevant sources of information for US plants that are monitored for potential new information by hazard type.
- Periodic reports summarizing the information that has been reviewed, highlighting any new hazard characterizations that might merit evaluation by the plant owner as well as any information that may result in future changes to hazard characterization. Reports with information unique to an individual site will only be available to the plant owner.
- Informal reports that address, on an as-needed basis, any significant changes to hazard estimates that should be considered before the periodic reports are available.

Price of Project

For participating US sites, the cost for participation will be $12,000 per plant site and includes monitoring and reporting of potential new hazard information for each participating site.

For non-US companies, the project includes collaboration and sharing of processes, operating experience, and best practices, but does not include site-specific monitoring and evaluation of hazard information. For EPRI Nuclear members outside the US, the cost is $5,000 per year per company. For EPRI participants outside the US who are not full EPRI Nuclear members, the cost is $10,000 per year per company.

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Project Status and Schedule

This project was begun in 2015 for US members in response to INPO IER L1-13-10, Recommendation 2. Over the first several years of the project, the catalog of sources as well as the screening and evaluation criteria were established and refined.

Based on global interest, the project is being opened to non-US participants starting in 2021. For these non-US participants, EPRI will facilitate collaboration and sharing information related to the monitoring and evaluation of potential changes to external hazards that may impact nuclear plants.

Who Should Join

US members should join this project to support implementation of INPO IER L1-13-10, Recommendation 2.

Non-US members who wish to share information related to the monitoring and evaluation of potential changes to external hazards that may impact nuclear plants are encouraged to join as well.

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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