

Earthquake statistics and a FOSM seismic hazard analysis for a nuclear power plant in Taiwan

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Abstract

High seismicity is observed around Taiwan owing to the regional geological background. Because earthquake prediction is still not practical at this time being, seismic hazard analysis given earthquake observations is considered one of the options for earthquake hazard mitigation. This study first presents the statistics of major earthquakes in the past 110 years around the study site in North Taiwan, where a nuclear power plant is under construction. In addition, we introduce a new application of the First-Order-Second-Moment probability analysis to estimate the seismic hazard. The result shows that there is a 30% probability that PGA could exceed 0.3 g in 50 years, associated with a major earthquake with its magnitude greater than 6.0 occurring within 200 km from the study site. Such a best estimate in seismic hazard could be valuable to the earthquake-resistant design of the critical structure under construction.

Keywords: First-Order-Second-Moment, seismic hazard analysis, statistics of earthquakes in Taiwan