Current status of design basis earthquake level for nuclear power plant sites in several countries

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According to strict criteria step by step for site selection, design, construction and operation, the seismic safety of nuclear power plant (NPP) sites in South Korea are secured by considering design basis earthquake (DBE) level capable of withstanding the maximum ground motions that can occur on the site. Therefore, it is intended to summarize DBE level and its evaluation details for NPP sites in several countries.

Similar but different terms are used for DBE from country to country, i.e. safe shutdown earthquake (SSE), design earthquake (DE), SL2, Ss, and maximum calculated earthquake (MCE). They may differ when applied to actual seismic design process, and only refer to approximate comparisons. This script used DBE as a representative term, and DBE level was based on horizontal values.

The DBE level of NPP sites depends on seismic activity of the area. Japan and Western United States, where earthquakes occur more frequently than South Korea, have high DBE values. The DBE level of NPP sites in South Korea has been confirmed to be similar or higher compared to that of Central and Eastern United States and Europe, which have similar seismic activity.