

Seismic Safety Regulations and Earthquake Science

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The first parts of seismic safety regulations for nuclear power plants consist of seismic and tsunami hazard evaluations as in the regulations for other structures. Although there are probabilistic and scenario assessments for the seismic hazard evaluation, the scenario assessment is mainly used and the probabilistic assessment is only in auxiliary use to evaluate remaining risk. Therefore, knowledge of earthquake science mostly contributes to making choices of scenario earthquakes in the scenario assessment.

This presentation mostly discusses the seismic hazard evaluation for nuclear power plants as the conveners requested, but also discusses the tsunami hazard evaluation as related to large subduction zone earthquakes. In addition, various phenomena occurring at nuclear power plants due to the 2011 Tohoku earthquake and their relation to these hazard evaluations and choices of scenario earthquakes are discussed.

We finally show from the above that the earthquake science cannot contribute to the real safety of a nuclear power plant unless unknown phenomena can be foreseen. We also discuss the danger of the idea that real safety can be reached if "decision is made without prejudice only from the scientific and technical point of view."