

Insufficient guideline and reviews on the volcanic risks to the Japanese nuclear power stations

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The 2011 East Japan earthquake and tsunami disaster caused the severe accident of the Fukushima Daiichi Nuclear Power Station (NPS) and the trust in national nuclear power management was completely lost. The Japanese government newly established the Nuclear Regulation Authority (NRA) in September 2012 and started to make the New Regulatory Requirements for light-water NPSs (NRR). After nine-months discussion by the working team, the NRR was fixed in July 2013.

The NRR includes a new guideline for considering risks of volcanic eruptions (Volcanic effects Assessment Guide: VAG), which did not exist before the 2011 disaster. However, the VAG shows no quantitative criteria to prohibit construction of NPS and thus enables arbitrary interpretation. The VAG also includes unrealistically optimistic views on both long-term and short-term predictions of volcanic eruptions. The VAG does not show any attention to large uncertainty in long-term estimate of large-scale eruptions. Moreover, the VAG explicitly supposes that large-scale eruptions of caldera volcanoes can be predicted several years before the eruption by monitoring.

In spite of opposition from many volcanologists, the VAG has been adopted for the conformity review of each NPS since July 2013 and the Sendai NPS was first authorized to satisfy the NRR in September 2014 under the condition that the volcanic activities of nearby calderas are always monitored. Although the Sendai NPS, located on the south Kyushu Island, is surrounded by at least 5 caldera volcanoes and was overlain by two large-scale pyroclastic flows for the past 120,000 years, there is no official damage estimate of nuclear disasters, which can be triggered by large-scale eruption of the caldera volcanoes.

Keywords: nuclear power station, volcanic risk assessment, guideline, conformity review, Sendai NPS, insufficient evaluation