

## The Mitigation Strategy Analysis of Kuosheng Nuclear Power Plant Spent Fuel Pool Using MELCOR2.1/SNAP

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**Abstract :** Kuosheng nuclear power plant (NPP) is a BWR/6 plant in Taiwan. There is more concern for the safety of Spent Fuel Pools (SFPs) in Taiwan after Fukushima event. In order to estimate the safety of Kuosheng NPP SFP, by using MELCOR2.1 and SNAP, the safety analysis of Kuosheng NPP SFP was performed combined with the mitigation strategy of NEI 06-12 report. There were several steps in this research. First, the Kuosheng NPP SFP models were established by MELCOR2.1/SNAP. Second, the Station Blackout (SBO) analysis of Kuosheng SFP was done by TRACE and MELCOR under the cooling system failure condition. The results showed that the calculations of MELCOR and TRACE were very similar in this case. Second, the mitigation strategy analysis was done with the MELCOR model by following the NEI 06-12 report. The results showed the effectiveness of NEI 06-12 strategy in Kuosheng NPP SFP. Finally, a sensitivity study of SFP quenching was done to check the differences of different water injection time and the phenomena during the quenching. The results showed that if the cladding temperature was over 1600 K, the water injection may have chance to cause the accident more severe with more hydrogen generation. It was because of the oxidation heat and the "Breakaway" effect of the zirconium-water reaction. An animation model built by SNAP was also shown in this study.

**Keywords :** MELCOR, SNAP, spent fuel pool, quenching

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