

Sloshing-Induced Overflow Assessment of the Seismically-Isolated Nuclear Tanks

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Abstract : This paper focuses on assessing sloshing-induced overflow of the seismically-isolated nuclear tanks based on Fluid-Structure Interaction (FSI) analysis. Typically, fluid motion in the seismically-isolated nuclear tank systems may be rather amplified and even overflowed under earthquake. Sloshing-induced overflow in those structures has to be reliably assessed and predicted since it can often cause critical damages to humans and environments. FSI analysis is herein performed to compute the total cumulative overflowed water volume more accurately, by coupling ANSYS with CFX for structural and fluid analyses, respectively. The approach is illustrated on a nuclear liquid storage tank, Spent Fuel Pool (SFP), for given conditions under consideration: different liquid levels, Peak Ground Accelerations (PGAs), and post earthquakes.

Keywords : FSI analysis, seismically-isolated nuclear tank system, sloshing-induced overflow

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