

عنوان مقاله:

Vertical Isolation of Seismic Loads in Aboveground Liquid Storage Tanks

محل انتشار:

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خلاصه مقاله:

This paper introduces an improved isolation system for aboveground storage tanks (ASTs). In this system, the tank shell is supported by a ring of vertical isolation systems (VIS) that dampen the rocking motion of the tank shell caused by dynamic loads. On the other hand, the forces in the vertical direction caused by the overturning moment are isolated as an alternative to the common horizontal system used for shear base isolation of ASTs. The effects of the proposed vertical isolation system on the seismic responses of the contained liquid are examined using various tank dimensions and earthquake ground motions. The finite element model (taking into account fluid-structure interaction effects) is used to simulate the contained liquid, as well as the tank shell. The results indicate that the new system could efficiently reduce the main seismic design parameters of the tanks, including base shear, overturning moment, and seismic stress in the tank shell. The sloshing wave height, however, is not significantly affected.

کلمات کلیدی:

Liquid Storage Tank, Isolating System, FEM, Seismic Design, Sloshing

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