Numerical and Experimental study on Sloshing Damper for a Cylindrical Tank

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Synopsis

The liquid sloshing in petroleum tanks is one of severe problem against huge earthquakes such as the Tokai Tonankai and Nankai earthquakes. In this study, we are developing a damper to reduce sloshing. The damper consists of partitions with slits which gives resistance to liquid moving in the tank. Model experiment and numerical simulation are performed to study the effect of the damper. As a result, the experimental results show that the present dumper is effective to reduce sloshing of cylindrical tank. And the numerical results show that our numerical simulation method can accurately simulate the sloshing behaviors of the cylindrical tank in which the dumper is installed.

Keywords : sloshing, cylindrical tank, damper, numerical analysis, VOF method