

عنوان مقاله:

Numerical Study on the Sloshing Behaviors of Dual Liquid Tanks with Gas Inflow

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خلاصه مقاله:

The finite volume method (FVM) is used to numerically investigate the sloshing behaviors of dual liquid tanks with gas inflow in this study. The sloshing process of a single liquid tank is simulated to verify the feasibility of the numerical method. Three different inlet boundary conditions are then discussed in order to obtain a reasonable gas flow rate. The sloshing process of a dual liquid tank with the gas inflow is simulated, and the effects of three different factors on the sloshing behaviors are investigated. The results indicate that the overload, flow rate, and filling ratio can affect the peak value of the impact force acting on the tank wall. The impact force is positively proportional to the overload (ΔG , ΔG , or ΔG). An increase in flow rate (50 g/s , 1000 g/s , or 5000 g/s) or a decrease in filling ratio (99.52% , 75.64% , or 63.69%) can increase the size and number of bubbles, leading to intensified sloshing behavior and increased impact force.

کلمات کلیدی:

Dual liquid tank, finite volume method (FVM), Gas inflow, Liquid tank sloshing, Multiphase flows

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