عنوان مقاله:

Investigations on the influence of aspect ratio on thermal buckling response of large-scale tanks

محل انتشار:

سومین کنفرانس بین المللی مهندسی عمران، سازه و زلزله (سال: 1399)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

Recent climate change has led to numerous fires around the world that could cause severe damage to the property and lives of humans and animals. Hence, designing and evaluating the performance of fire extinguishing equipment in places where a fire is more likely to occur is of high importance. In a wide variety of fire scenarios, water plays a crucial role in putting out the blaze, and its storage tanks must be sufficiently reliable. Therefore, in this study, the fire is simulated using a finite volume numerical method, and the effect of heat emitted on the nearby water storage tank is studied. Also, the impact of the aspect ratio (height to diameter) of the container on the nonlinear buckling behavior of the structure, temperature, and critical time is investigated. Concerning the simulation outputs, a suitable range for resisting external thermal loads and maximizing its stability threshold is provided by considering the aspect ratio parameter. The results of this study can be used to optimize the design of tanks and improve its stability behavior against external heat load

کلمات کلیدی:

Thermal Loading, Fire-induced Instability, Aspect Ratio, Thermal buckling, Safe Design