

عنوان مقاله:

SHOCK WAVE ON FLUID-FILLED ORTHOTROPIC CROSS-PLY CYLINDRICAL STRUCTURE SUBMERGED IN FLUID

محل انتشار:

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خلاصه مقاله:

Multilayered, elastic circular cylinders and cylindrical shells are common elements in marine structural. As an impulse acts, the propagation of the mechanical disturbance with wave speeds makes a multilayered cylinder respond immediately to the impulse at the place of wave incident. Wardlaw and Luton (2000) considered an explosion inside a fluid-filled cylindrical shell, focusing their study on the internal pressure fields and the dynamics of the shell [2]. Yin and Yue in 2002, proposed an exact solution and approximate solution to determine the transient response of infinitely long multilayered cylinder under dynamic pressures on the boundaries. This approach is based on expansion of transient wave functions in a series of eigenfunctions [5]. (2008), Savruk and coworkers proposed a new method based on finite difference just with respect to time, in order to dynamic solution of elastic hollow cylinders subjected to the surface dynamic forces [3]. One year later, Onyshko and Senyuk used this proposed method, to determine the dynamic response of two layered cylinder under dynamic loading [4]. (2009), Chen and Lin investigate the elastic analysis for a cylinder made of FGMs. The problem is reduced to solve an ordinary differential equation numerically. The obtained result shows that the FGMs property has a significant influence to the stress distribution [6]. In this work was investigated the transient dynamic response of thick-walled orthotropic cross-ply cylindrical structure. Structure made of orthotropic material and fluid supposed ideal. Solving in time domain was accomplished by Laplace transformation. In this article the shock wave is supposed mechanical load and acting on outer surface of structure. Numerical results are presented for [0/90/0], [90/0/90], [0/90/0/90/0], [90/0/90/0/90], [0/90/0/90/0/90/0] and [0/90/0/90/0/90/0/90/0] stacking sequences.

کلمات کلیدی:

Multilayered, Submerged, Cross-Ply, Shock wave, Cylinder, Transient Response

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