

Failure Detection in an Edge Cracked Tapered Pipe Conveying Fluid Using Finite Element Method

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Abstract : The crack is one of the most common types of failure in pipelines that convey fluid, and early detection of the crack may assist to avoid the piping system from experiencing catastrophic damage, which would otherwise be fatal. The influence of flow velocity and the presence of a crack on the performance of a tapered simply supported pipe containing moving fluid is explored using the finite element approach in this study. ANSYS software is used to simulate the pipe as Bernoulli's beam theory. In this paper, the fluctuation of natural frequencies and matching mode shapes for various scenarios owing to changes in fluid speed and the presence of damage is discussed in detail.

Keywords : damage detection, finite element, tapered pipe, vibration characteristics

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