عنوان مقاله:

MODAL ANALYSIS OF A TURBO-PUMP SHAFT: AN INNOVATIVE SUSPENDING METHOD TO IMPROVE THE RESULTS

محل انتشار:

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خلاصه مقاله:

Modal parameter extraction of high speed shafts is of critical importance in mechanical design of turbo-pumps. Due to the complex geometry and peripheral components of turbo-pumps, difficulties can arise in determination of modal parameters. In this study, modal properties of a turbo-pump shaft, was studied by experimental modal analysis, and using different excitation techniques. An innovative suspending method is proposed to reduce noise-to-signal ratio, resulting from classic suspensions. Comparison of the experimental results obtained from the proposed suspension method and the traditional ones shows that the proposed approach was a promising method, when classic methods fall short of expectations in analysis of complex structures. To validate the experimental results, numerical solution was carried out using simplified geometric modeling combined with the Finite Element Method. The simplified modeling approach can be considered as a reliable theoretical method for numerical modal analysis of similar structures. Comparison of experimental and numerical results shows that there is a good conformity between the .results of two approaches

کلمات کلیدی:

Turbo-pump, shaft, experimental modal analysis, numerical modal analysis, suspension techniques