World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:8, No:03, 2014

Measuring Investigation and Computational Simulation of Cavitation Phenomenon Effects on the Industrial Centrifugal Pump Vibration

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Abstract : In this paper, vibration of the industrial centrifugal pumps studied by measuring analysis and computational simulation. Effects of different parameters on pump vibration were investigated. Also, simulation of cavitation in the centrifugal pump was down. First, via CF-TURBO software, the pump impeller and the fluid passing through the pump is modelled and finally, the phenomenon of cavitation in the impeller has been modelled by Ansys software. Also, the effects of changes in the amount of NPSH and bubbles generation in the pump impeller were investigated. By simulation of piping with pipe flow software, effect of fluid velocity and pressure on hydraulics and vibration were studied computationally by applying Computational Fluid Dynamic (CFD) techniques, fluent software and experimentally. Furthermore, this comparison showed that the model can predict hydraulics and vibration behaviour.

Keywords : cavitation, vibration, centrifugal pumps, performance curves, NPSH
Conference Title : ICMETA 2014 : International Conference on Mechanical Engineering : Theory and Application
Conference Location : Singapore, Singapore
Conference Dates : March 30-31, 2014