World Academy of Science, Engineering and Technology
International Journal of Aerospace and Mechanical Engineering
Vol:19, No:10, 2025

Influence of Leakage Flow on the Suction Performance of a Mixed Flow Pump with Semi-Open Casing

Authors : Ujjwal Shrestha, Young-Do Choi

Abstract : Mixed-flow pump plays a significant role in industry and agricultural fields. Cavitation and leakage flow are major concerns for the mixed-flow pump. Leakage flow is caused due to the tip clearance gap, which induces pressure fluctuation and cavitation in the mixed flow pump. Cavitation bubbles are formed due to the drop of local static pressure below vapor pressure at a given temperature. Cavitation bubbles will move toward the high-pressure region and collapse due to pressure differences. The bursting of cavitation bubbles induces pressure fluctuations and shock waves in the impeller flow passage. The focus of the study is to evaluate the influence of the leakage gap on the suction performance of a mixed-flow pump with a semi-open casing. The critical cavitation number is relatively higher in full load conditions compared to partial load conditions. The additional CFD analysis will help to correlate suction performance and leakage flow in a mixed-flow pump with a semi-open casing.

Keywords : mixed flow pump, leakage flow, suction performance, semi-open casing
Conference Title : ICTFD 2025 : International Conference on Turbomachinery and Fluid Dynamics
Conference Location : Barcelona, Spain
Conference Dates : October 25-26, 2025