

3rd International Conference on

Fluid Dynamics & Aerodynamics

October 25-26, 2018 | Berlin, Germany

Study on unsteady characteristics of secondary flow in volute of a high specific speed centrifugal pump

Liu Tao¹, Zhou Peijian² and Mou Jiegang²
NSFC, China

Because of the rotor-stator interaction between impeller and volute, high specific speed centrifugal pump is easy to induce high amplitude pressure fluctuation. At the same time, it is easy to form secondary flow vortex in volute, and the stability of the pump will be worse in severe case. Based on the model of SST k- ω , non-steady flow of the centrifugal pump in 3 typical working conditions have been calculated by Fluent, and the internal flow field and pressure fluctuation characteristics are obtained. Besides the distribution characteristics of secondary flow vortex in the volute of the centrifugal pump are further analyzed. The results show that the pressure fluctuation peak of each monitoring points occurs at the place where the blade passing frequency under different flow conditions. It is also found that there is obvious secondary flow vortex in the volute at different flow conditions, and the shape of secondary vortices also varies periodically. The research can provide a theoretical basis for the operation stability of the high specific speed centrifugal pump unit.

liutaodsp@163.com