عنوان مقاله:

Investigation of Parameters Affecting Axial Load in an End Suction Centrifugal Pump by Numerical Analysis

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خلاصه مقاله:

The total force produced in the axial direction on a pump is called axial load and is caused by the pressure difference between the front and rear of the impeller and the hydrostatic force in the suction direction. In a centrifugal pump, ۳D computer-aided analysis programs are used to design and reduce R&D and manufacturing costs. In this study, parameters affecting axial load of the centrifugal pump with a single suction and closed impeller were investigated by using the Computational Fluid Dynamics (CFD) method. In this context, the flow rate and the some physical properties such as the back gap of the impeller, wear ring and balancing holes, of the centrifugal pump were investigated to determine how much affected the axial load. The results showed that the wear ring and the balancing holes give rise to effective results on the axial load, while the back gap of the impeller does not affect the large extent. With the design changes made with these parameterizations, the axial force was reduced by up to ۶۰%, whereas the efficiency was decreased by ۵%. The loss of efficiency due to this decrease in axial force is negligible. However, higher efficiency values were also found at a different point from the working point where the axial load is lowest.

کلمات کلیدی:

Centrifugal pump, Thrust load, Axial load, Balancing hole, Wear ring, Computational fluid dynamics