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A review on development in design of multistage centrifugal pump

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Abstract. Multi-stage pumps are the most popular pumps among various kinds of centrifugal pumps. A thorough review of different kinds of literature has led to the conclusion that there is a desperate need to increase the performance of the multi-stage centrifugal pump. Many investigators have put their efforts to increase the pump performance and also the work is being projected on various aspects of pump performance variables. To improve the multistage centrifugal pump performance by investigation, modification, and analysis many works of literature are available. For analysis, many researchers used the Navier-Stokes solver to create the three-dimensional unsteady turbulent flow numerical model with the standard k-ε turbulent equation. This paper mainly focuses on research related to the multi-stage centrifugal pump.

Keywords: hydraulic machine; modeling; multi-stage centrifugal pump; standard k-ε turbulent equation

1. Introduction

The Multi-stage centrifugal pump is widely used in agriculture, industries, domestic applications, and mining enterprises. The hydraulic machines which convert the mechanical

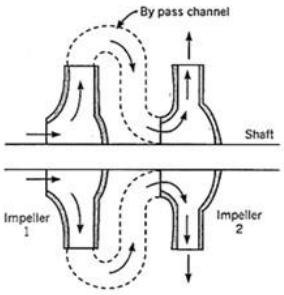

Fig. 1 Line diagram of a multi-stage centrifugal pump

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Appendix

Nomenclature

n	Total number of stages
ΔH	Increase in Head in each stage (m)
ΔP	Increase in pressure in each stage (N/m^2)
ρ	Density of liquid (kg/m^3)
g	Acceleration due to gravity (9.81 m/s^2)