

ABSTRAK

Penelitian ini bertujuan untuk mengevaluasi secara komprehensif pengaruh variasi sistem perpipaan serta konfigurasi sambungan ball valve terhadap performa operasional pompa sentrifugal. Dalam studi ini, jenis sistem perpipaan yang digunakan meliputi dua kategori utama, yaitu sistem perpipaan single pump dan sistem perpipaan jet pump. Selain itu, sambungan ball valve diatur dalam setiap 2 derajat yang berbeda, yaitu 90 derajat sampai 2 derajat. Parameter kinerja pompa yang dianalisis mencakup debit aliran, total head, daya pompa, serta efisiensi keseluruhan dari sistem. Metode yang digunakan dalam penelitian ini adalah metode eksperimental, dengan pengujian dilakukan pada dua sistem perpipaan, yakni sistem single pump dan sistem jet pump. Hasil dari eksperimen menunjukkan adanya perbedaan antara variasi sistem perpipaan dan bukaan ball valve terhadap peningkatan kinerja pompa sentrifugal. Penelitian ini memberikan kontribusi penting sebagai pedoman teknis dalam memilih jenis pipa hisap serta mengatur bukaan ball valve yang sesuai untuk meningkatkan performa dan efisiensi pompa sentrifugal dalam berbagai aplikasi industri dan rumah tangga.

Kata kunci : Pompa sentrifugal, pipa hisap, *ball valve*, *jet pump*, efisiensi pompa.

ABSTRACT

This study aims to comprehensively evaluate the influence of piping system variations and ball valve connection configurations on the operational performance of centrifugal pumps. The piping systems utilized in this research are categorized into two main types: single pump systems and jet pump systems. Additionally, ball valve connections are configured at increments of 2 degrees, ranging from 90 degrees to 2 degrees. The pump performance parameters analyzed include flow rate, total head, pump power, and overall system efficiency. The methodology employed in this study is experimental, involving tests conducted on both single pump and jet pump piping systems. The experimental results indicate a significant correlation between variations in piping systems and ball valve openings with the improvement of centrifugal pump performance. Specifically, the use of single pump systems and precise ball valve opening configurations have been proven to substantially enhance pump efficiency. For jet pump systems, optimal efficiency was achieved at a 26-degree ball valve opening, whereas in single pump systems, a 60-degree opening yielded the highest efficiency levels. This study provides valuable technical guidance for selecting appropriate suction pipe types and adjusting ball valve openings to enhance the performance and efficiency of centrifugal pumps across various industrial and domestic applications.

Keywords: Centrifugal pump, suction pipe, ball valve, jet pump, pump efficiency