Evaluation of LCV Valve Closing Effect on Force Increase Of Hot Well Pump Using FLUENT Simulation

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Abstrak
Gresik Steam Power Plant has a circulating water system which circulate condensate from condenser to cooling tower and back to condenser. Inside this system, there is a butterfly valve called LCV that used to control the water flow from condenser to cooling tower. LCV position is controlled by a discrete type control system, having dead band of 1%. The dead band caused unsmooth movement of LCV, causing sudden flow condition changing. This problem has gotten worse by the overshoot acknowledged on every LCV closing. The sudden flow condition changing is believed to cause extra loading on Hot Well Pump (HWP) which may resulted in HWP breakdown. The final year project evaluates the effect of LCV closing on HWP and then finds the suitable solution. The evaluation is done by modeling the flow in the system using FLUENT software. Having knowledge of the condition changing cause by valve closing, the research continued by modeling the flow inside HWP, also using FLUENT. The result of system flow mmodeling is flow condition changing. Mass flow rate become the most concerned point. Then, by conducting HWP flow modeling using FLUENT, the knowledge of force changing because of mass flow rate changing on the HWP impeller is achieved. The result of present system modeling then compared to the result of previous system and developed system, giving the better system to be implemented.