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Optimization of Piston Pump In Hydraulic Valve Leakage Testing Machine

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Abstract : In this project we have discussed about optimization of "Piston Pump" in hydraulic valve leakage testing machine. In power plants, valves like pressure relief valve and gate valves are used to control the flow rate of steam or water in pipelines and other systems like Boilers, turbines etc. Valve manufactures such as BHEL, who produces the valves for power plants normally test them with in their company. Generally testing is carried out in two ways such as STEAM TESTING and HYDRO TESTING. In order to carry out the testing successfully, high pressure steam and high pressure water are used. To be specific, pressure steam is used for steam testing and high pressure water is used for hydro testing. The pressure of water is around 1000bar-1200bar and to pressurize the water three stages of double acting piston pumps are used, this consumes a lot of air and moreover, maintenance also very high and hence to reduce the maintenance and to conserve the air, three single acting pumps has to be fitted on bench after suitable modification of pneumatic and hydraulic scheme. The advantages of single acting air liquated pump are it is very simple to construct, very easy to maintain, high efficiency and high testing quality. Another disadvantage in the hydro testing station is the dusts are deposited in the check valves frequently. Due to this problem the testing operation is stopped for 4-5 hours/week. To rectify this problem high pressure filters are fitted before the check valves.