DESIGN PIPE LINE KONDENSATE WATER FROM SAMPLING RACK TO RAW WATER TANK PIT

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ABSTRACT

PLTU Perak Surabaya using steam which is working in closed loop circulation. The steam used is condensed using sea water that will be used as feed water into boiler all over again. Currently, the condensate that flow through the sampling rack are drained into the environment; it has not circulated back because no channel is connected to the RWT-pit (Raw Water Tank). Actually, the condensate have potential water up to 226.8 liters/day. This water could be able to substitute a part of water purchase.

As a consequence, PLTU Perak Surabaya needs to build a channel that it will be connect the sampling rack to the RWT-pit. This investment allows the purchase of raw water saving. This final project has been calculated the pipeline or channel that is designed depend on the potential water as well as the field conditions. Technically, the calculations design of pipeline based on the diameter and the head loss rationally. Material price of the pipe construction is calculated related to the economical approach. Obviously, the substitution raw water (PDAM) could increase the efficient of PLTU relatively regarding the environmental conservation as well as water purchasing.

Based on the assumptions, the result shows the pipeline design have technical specification: the total length of pipe is 228.4 meters for pipe diameter 2" and 3". The major losses that occured is 5.023meters and the minor losses is 1.76meters; therefore the total head losses equal to 7.102meters. The carbon steel pipe uses to flow the condensate water by velocity is 2.324 m/s and the Reynolds number is 5x10^5; so the flow is turbulen. Refer to the long life of the pipelines, the investment will back during (ROI) 4 years; meanwhile this pipe line possible be operated up to 15 years in a normal conditions.