

ABSTRACT

The blowdown tank functions to collect blowdown water from all drain line of HRSG (Heat Recovery Steam Generator) drum, water from blowdown tank will be discharged to the plant drain line toward pendem tank and steam will be discharged through exhaust blowdown tank to the air. If pendem tank is not polluted and conductivity of the air is not high, it will be used directly to the Raw Water Tank. However, if the pendem tank water conductivity is too high, it will be streamed to the Sewage Tank prior to the Waste Water Treatment Plant. In this research, blowdown water from pendem tank will be used for Reverse Osmosis feeder passing through the SWRO (Sea Water Reverse Osmosis) tank.

Based on the calculations results and new pipe design making to the SWRO tank, it is obtained that fluid flow velocity is 1,274 m/s, total energy loss is 6,357 m, and required pump power is 31,07 kWatt. Calculation of water blowdown from HRSG during StartUp Combined Cycle is 28,6 tons or 28,600 liters. The modification design of new pipeline for the utilization of blowdown water in pendem tank toward SWRO tank can be used to increase company profits.

Keywords: Water Blowdown, Total Energy Loss, Pump Power

INTISARI

Blowdown tank berfungsi menampung air *blowdown* dari semua *line drain* dari *drum HRSG (Heat Recovery Steam Generator)*, air dari *blowdown tank* akan dibuang ke *line plant drain* menuju tangki pendem dan uap akan dibuang ke udara luar melalui *exhaust blowdown tank*. Jika tangki pendem tidak tercemar dan konduktivitas air tidak tinggi maka akan dimanfaatkan langsung ke *Raw Water Tank*. Tapi bila konduktivitas air tangki pendem terlalu tinggi akan dialirkan ke *Sewage Tank* sebelum ke *Waste Water Treatment Plant*. Dalam penelitian ini air *blowdown* dari tangki pendem akan dimanfaatkan untuk pengumpan *Reverse Osmosis* melewati tangki *SWRO (Sea Water Reverse Osmosis)*.

Berdasarkan hasil perhitungan dan pembuatan desain pipa baru menuju tangki *SWRO*, didapatkan kecepatan aliran fluida 1,274 m/dt, total kerugian energi sebesar 6,357 m, dan daya pompa yang dibutuhkan 31,07 kWatt. Perhitungan air *blowdown* dari *HRSG* saat *StartUp Combined Cycle* sebesar 28.6 ton atau 28.600 liter. Perancangan modifikasi jalur pipa baru untuk pemanfaatan air *blowdown* pada tangki pendem menuju tangki *SWRO* dapat digunakan untuk meningkatkan keuntungan perusahaan.

Kata kunci: Air *blowdown*, kerugian energi total, daya pompa.