

ABSTRACT

High-Pressure Heater (HPH) in the steam power plant serves to increase the efficiency of the plant by heating feedwater before entering the boiler. Tanjung Awar-Awar power plant there are three HPH installed in series, which means that feedwater is pumped by the feedwater pump from the deaerator to HPH 3, out of HPH 3 into HPH 2, and then until feedwater entering the economizer. The current condition there is only one bypass channel that feedwater flows directly to the economizer if there is damage to one or two HPH. It can increase heat rate of the boiler because the temperature of the feedwater entering boiler is low due to not heating in the HPH. Therefore analysis of feedwater temperature is carried out as a reference for the addition of bypass channels in each HPH.

Analysis was carried out on several conditions, that is: all HPH are inservice, HPH 3 is outservice, HPH 2 is outservice, HPH 1 is outservice, HPH 3 and HPH 2 are outservice, HPH 3 and HPH 1 are outservice, HPH 2 and HPH 1 are outservice, and all HPH are outservice. The feedwater temperature in the inlet economizer when the conditions are respectively 273.4 °C, 252.08 °C, 238 °C, 238.8 °C, 215.9 °C, 216.66 °C, 202.2 °C, 179.4 °C. The highest feedwater temperature was 273.4 °C when the conditions of all HPH are inservice and the lowest feedwater temperature was 179.4 °C when all HPH are outservice.

From the results of the analysis, the addition of bypass channels in each HPH has the advantage, the temperature of feedwater in the inlet economizer is higher when compared to passing feedwater by direct bypass or the condition of all HPH are outservice. The results of the analysis are expected to be a consideration for the design of bypass channels in each HPH.

Keyword: High-pressure heater, feedwater, temperature



INTISARI

High Pressure Heater (HPH) pada PLTU berfungsi untuk meningkatkan efisiensi pembangkit dengan memanaskan air umpan (*feedwater*) sebelum masuk *boiler*. PLTU Tanjung Awar-Awar memiliki tiga HPH yang dipasang secara seri, ini berarti *feedwater* dipompa oleh *feedwater pump* dari *deaerator* menuju HPH 3, keluar dari HPH 3 masuk HPH 2, dan seterusnya sampai *feedwater* menuju *economizer*. Kondisi saat ini hanya terdapat satu saluran *bypass* yang mengalirkan *feedwater* langsung menuju *economizer* apabila terjadi kerusakan pada salah satu atau dua HPH. Hal ini dapat menyebabkan *heat rate boiler* meningkat karena temperatur *feedwater* yang masuk *boiler* masih rendah akibat tidak mengalami pemanasan di HPH. Oleh karena itu dilakukan analisis temperatur *feedwater* sebagai acuan untuk penambahan saluran *bypass* pada setiap HPH.

Analisis dilakukan pada beberapa kondisi, yaitu : semua HPH *inservice*, HPH 3 *outservice*, HPH 2 *outservice*, HPH 1 *outservice*, HPH 3 dan HPH 2 *outservice*, HPH 3 dan HPH 1 *outservice*, HPH 2 dan HPH 1 *outservice*, serta kondisi semua HPH *outservice*. Temperatur *feedwater* pada *economizer inlet* ketika kondisi tersebut masing-masing adalah 273,4 °C, 252,08 °C, 238 °C, 238,8 °C, 215,9 °C, 216,66 °C, 202,2 °C, 179,4 °C. Temperatur *feedwater* paling tinggi adalah 273,4 °C ketika kondisi semua HPH *inservice* dan temperatur *feedwater* paling rendah adalah 179,4 °C ketika semua HPH *outservice*.

Hasil dari analisis adalah penambahan saluran *bypass* pada setiap HPH memiliki keuntungan, temperatur *feedwater* pada *economizer inlet* lebih tinggi jika dibandingkan dengan melewati *feedwater* pada *bypass* langsung atau kondisi semua HPH *outservice*. Hasil analisis diharapkan mampu menjadi bahan pertimbangan untuk perancangan saluran *bypass* pada setiap HPH.