

Pengaruh tekanan tabung penampung air pendingin kondenser PLTU dan pinch point terhadap konsumsi energi spesifik dan produksi akuades pada throttling process = Influence of condenser cooling tube water pressure tube and pinch point against specific energy consumption and aquades production at throttling process

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Abstrak

ABSTRACT

Throttling process adalah proses ekspansi fluida dari tekanan tinggi ke tekanan rendah dengan entalpi tetap sehingga terjadi perubahan fasa dan penurunan temperatur. Selain itu, kerja yang dilakukan energi kinetic dan perpindahan kalor yang melalui katup throttling juga sangat kecil sehingga dapat diabaikan. Penelitian ini bertujuan untuk konservasi energy dengan melakukan simulasi perhitungan efisiensi thermal PLTU dengan penambahan alat throttling process dengan variable pinch point temperatur di dalam kondenser dan tekanan fluida pendingin keluaran throttling process di tabung penampung. Berdasarkan simulasi didapatkan bahwa efisiensi thermal PLTU meningkat dengan adanya penambahan throttling proses. Khususnya semakin besar pinch point temperatur di dalam kondenser maka efisiensi thermal PLTU semakin besar. Dan semakin kecil tekanan fluida pendingin keluaran throttling process di tabung penampung maka semakin besar juga efisiensi thermal PLTU. Penambahan throttling proses ini juga menghasilkan air desalinasi. Diharapkan hasil akhir dari penelitian ini adalah penambahan efisiensi thermal PLTU, air buangan kondenser yang ramah lingkungan, serta menghasilkan air desalinasi dengan penambahan throttling process.

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ABSTRACT

Throttling process is a fluid expansion process from high pressure to low pressure with fixed enthalpy resulting in phase change and temperature drop. In addition, work done by kinetic energy and heat transfer through the throttling valve is also very small so it can be ignored. This research aims to conserve energy by simulating the calculation of thermal efficiency of the steam power plant with the addition of a throttling process tools with variable pinch point temperature inside the condenser and the pressure of the throttling process cooling fluid in the container tube. Based on the simulation it is found that thermal efficiency of the steam power plant increases with the addition of throttling process. In particular, the larger the temperature pinch point in the condenser, the thermal efficiency of the power plant is greater. And the smaller the cooling fluid pressure of the throttling process output in the container tube then the greater the thermal efficiency of the steam power plant. The addition of throttling process also produces aquades. It is expected that the end result of this research is the addition of thermal efficiency of steam power plant, environmentally friendly condenser water, and produce desalination water, with the addition of throttling process.