Perencanaan sistem pendingin udara masuk gas turbin 20c menggunakan absorption chiller di pltgu ubp priok = Planning for air cooling system with a gas turbin inlet 20c using absorption chiller at pltgu ubp priok

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Abstrak

Pembangkit Listrik Tenaga Gas di Indonesia memiliki potensi yang sangat baik, meskipun nilai efisiensinya sangat rendah karena tingginya temperatur ambient di Indonesia. Hal ini dapat diantisipasi dengan mengombinasikan turbin gas dengan turbin uap menjadi Pembangkit Listrik Tenaga Gas dan Uap (PLTGU) yang memiliki efisiensi yang tinggi. Namun demikian, upaya peningkatan efisiensi turbin masih perlu dilakukan mengingat sumber energi bahan bakar yang semakin menipis dan mahal. Dengan memanfaatkan laju aliran uap dari Heat Recovery Steam Generator (HRSG) sebagai sumber panas untuk sistem pendingin absorption chiller, temperatur udara masuk turbin gas dapat diturunkan hingga temperatur 20°C. Hal ini mengakibatkan peningkatan daya turbin gas sebesar 10,94 MW serta peningkatan efisiensi termal sebesar 2,98%, walaupun pengurangan laju aliran uap pada HRSG membuat turbin uap kehilangan daya sebesar 2,343 MW. Secara keseluruhan, total daya output yang dihasilkan PLTGU dengan pemasangan sistem pendingin absorption chiller dapat meningkat sebesar 8,597 MW.

.....The potential of gas power plant in Indonesia is very high though it has a very low efficiency due to high ambient temperatures in Indonesia. This condition can be anticipated by combining a gas turbine with a steam turbine into Gas and Steam Power Plant (GSPP) which has high efficiency. However, the effort to increase the efficiency of the turbine is still needed considering fuel energy sources is dwindling and becoming more expensive. By utilizing the flow rate of steam from the Heat Recovery Steam Generator (HRSG) as a heat source of absorption chiller cooling system, inlet air temperature of gas turbine can be lowered to a temperature of 20°C. This results the power of gas turbine and the thermal efficiency increases by 10.94 MW and 2.98% respectively, although the reduction of the steam flow rate in HRSG makes the steam turbine loss power by 2,343 MW. As a whole, the total power output generated by GSPP through the installation of absorption chiller cooling system can be increased by 8,597 MW