

Analisis kinerja sistem pendingin arus searah (DC Cooler) sebagai upaya konservasi energi pada BTS (Base Transceiver Station) = Performance analysis of direct current cooling system (DC Cooler) as energy conservation efforts at the BTS (Base Transceiver Station)

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Abstrak

BTS merupakan komponen jaringan telekomunikasi seluler yang berhubungan langsung dengan pelanggan yang berada dalam jangkauannya. Untuk mengurangi akumulasi panas dari radiasi matahari dan peralatan BTS, diperlukan sistem pendingin guna meningkatkan kinerja dan umur peralatan BTS. Sistem pendingin BTS menyerap hampir setengah dari konsumsi energi listrik BTS.

Tujuan penelitian ini adalah melakukan upaya konservasi energi pada BTS, dengan melakukan modifikasi dc cooler menjadi lebih efisien. Pada penelitian ini, akan dilakukan studi literatur yang berhubungan dengan sistem pendingin dan teknologi termoelektrik. Kemudian merancang prototip dc cooler dengan modifikasi casing, fan, dan heatsink. Selanjutnya prototip-prototip tersebut diuji untuk mengetahui kinerjanya. Hasil pengujian dianalisis dan dibandingkan dengan COP (Coefficient Of Performance) dc cooler awal.

Dari hasil pengujian diketahui bahwa penggunaan casing panjang yang menutupi seluruh heatsink dan penggunaan fan dengan daya lebih kecil dapat meningkatkan COP sebesar 10.46 %. Dan dapat menghemat energi listrik sebesar 18.5 KWH perunit selama satu tahun.

BTS is a component of a mobile telecommunications network that relate directly to customers within its range. To reduce the accumulated heat from solar radiation and BTS equipment, cooling systems needed to improve the performance and lifetime of BTS equipment. BTS cooling system absorbs almost half of electrical energy consumption of the BTS.

The purpose of this research is to perform energy conservation efforts at the BTS, by modifying dc cooler becomes more efficient. In this research, will carried out literature studies related to the cooling system and thermoelectric technology. Then design prototype dc cooler with modification of varying the casing, fan, and heatsink. Furthermore, the prototype is tested to determine its performance. The test result are analysed and compared with the COP (Coefficient Of Performance) of the original dc cooler.

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