

ABSTRACT

Cooling Tower is one of the important components in the central air conditioning system. Cooling tower is a heat exchanger that functions to dissipate heat from the condenser cooling water to the environment. The heat transfer process in the cooling tower at PT Angkasa Pura 1 (Persero) Yogyakarta International Airport is expected to reach temperatures close to 27.2°C. One of the causes of cooling tower performance not approaching the wet bulb temperature is the presence of dirt attached to the cooling tower fill.

To determine the performance of the cooling tower, it is necessary to analyze the performance of the cooling tower, including the analysis and calculation of the cooling capacity, range, approach, and effectiveness of the cooling tower. Data on the temperature of the cooling water entering and leaving the cooling tower is taken in September – November 2020 and January – February 2021 every 10 am. Furthermore, this analysis will be one of the company's considerations for cleaning the cooling tower.

The results of the analysis show that the dirt on the fill causes a decrease in cooling tower performance by decreasing the cooling effectiveness value by 3% - 5%, as well as a decrease in cooling ability by 46,052.58 MJ/day. The cooling tower performance during cleaning every 2 months with a cooling effectiveness value of 49.85% is better than cleaning every 3 months with a cooling effectiveness value of 45.78%.

INTISARI

Cooling Tower adalah salah satu komponen penting pada sistem AC central. *Cooling tower* adalah alat penukar panas yang berfungsi membuang panas air pendingin kondensor ke lingkungan. Proses perpindahan panas pada *cooling tower* di PT Angkasa Pura 1 (Persero) Yogyakarta International Airport diharapkan dapat mencapai suhu yang mendekati temperatur 27,2°C. Salah satu penyebab kinerja *cooling tower* tidak dapat mendekati temperatur *wet bulb* adalah adanya kotoran yang menempel pada *fill cooling tower*.

Untuk mengetahui kinerja *cooling tower*, diperlukan analisa performa *cooling tower*, diantaranya adalah analisa dan perhitungan terhadap *cooling capacity, range, approach*, dan efektifitas *cooling tower*. Data suhu air pendingin masuk dan keluar *cooling tower* diambil pada bulan September – November 2020 dan Januari – Februari 2021 setiap jam 10 pagi. Selanjutnya analisa tersebut akan menjadi salah satu pertimbangan perusahaan untuk melakukan pembersihan *cooling tower*.

Hasil analisa menunjukkan bahwa kotoran pada *fill* mengakibatkan penurunan kinerja *cooling tower* dengan menurunnya nilai efektifitas pendinginan 3% - 5%, serta penurunan kemampuan pendinginan sebesar 46.052,58 MJ/hari. Kinerja *cooling tower* pada saat pembersihan 2 bulan sekali dengan nilai efektifitas pendinginan 49,85% lebih baik daripada pembersihan 3 bulan sekali dengan nilai efektifitas pendinginan 45,78%.