

ABSTRACT

PT. Geo Dipa Energi Dieng acts as a provider of electricity that utilizes geothermal energy to increase electricity supply in the Java-Bali system. In March 2019, several problems that occurred at the power plant were discovered, namely the turbine experiencing power down problems. The cause of the first drop in power is due to the reduced water level in the basin pool which affects the vacuum that occurs in the main condenser which causes the turbine performance to decrease. Power down conditions that occur, the power plan team decided to shutdown. So it is necessary to check the parts and measure the effectiveness of the cooling tower. Some of the problems that occur in the cooling tower are the internal parts, the drift eliminator is damaged due to being stepped on frequently, the sprayer is released and the nozzle has dirt, and many filler conditions are brittle. In mechanical equipment that is the condition of the fan the tilt angle changes, corrosion on the clamp, hub, and motor baseframe. Bend the air breather which causes overpressure on the gearbox.

The method used to determine the internal conditions of parts and mechanical equipment is done by observation and interview methods. The observation method is done directly by engaging in cooling tower operational system activities. Whereas in taking the theme of the problems that occur in the cooling tower operational system is done by using the interview method and the analysis of the surrounding conditions.

The results of the analysis of the internal conditions of parts and mechanical equipment found several parts that need the repair and replacement of new parts. Parts repair and replacement are carried out to maximize cooling tower performance. The results of the effectiveness of the cooling tower for six days obtained the value of the effectiveness of the cooling tower ranges from 85.56% - 90.46%. Based on the overall equipment effectiveness standard of 85% or more it can be concluded that the average value of the effectiveness of the cooling tower has met the standard.

Keywords : cooling tower, effectiveness, internal part, mechanical equipment

INTISARI

PT. Geo Dipa Energi Dieng berperan sebagai penyedia tenaga listrik yang memanfaatkan panas bumi untuk menambah pasokan daya listrik pada sistem Jawa-Bali. Pada bulan Maret 2019 ditemukan beberapa permasalahan yang terjadi pada *power plant* yaitu turbin mengalami permasalahan turun daya. Penyebab turun daya pertama ini disebabkan berkurangnya level air pada kolam basin yang berpengaruh terhadap *vacum* yang terjadi pada *main condenser* yang menyebabkan kinerja turbin menurun. Kondisi turun daya yang terjadi, *team power plan* memutuskan untuk melakukan *shutdown*. Sehingga perlu dilakukan pengecekan *part* dan pengukuran efektivitas dari *cooling tower*. Beberapa masalah yang terjadi pada *cooling tower* yaitu pada *internal part*, *drift eliminator* rusak akibat sering terinjak, *sprayer* terlepas dan *nozzle* terdapat kotoran, dan kondisi *filler* banyak yang getas. Pada *mechanical equipment* yaitu kondisi *fan* sudut kemiringannya berubah, korosi pada *clamp*, *hub*, dan *baseframe* motor. Tekukan *air breather* yang mengakibatkan *overpressure* pada *gearbox*.

Metode yang digunakan untuk mengetahui kondisi *internal part* dan *mechanical equipment* dilakukan dengan metode observasi dan wawancara. Metode observasi dilakukan dengan terjun langsung dalam kegiatan sistem operasional *cooling tower*. Sedangkan dalam pengambilan tema permasalahan yang terjadi dalam sistem operasional *cooling tower* dilakukan dengan menggunakan metode wawancara dan analisis kondisi sekitar.

Hasil dari analisis kondisi *internal part* dan *mechanical equipment* ditemukan beberapa *part* yang perlu adanya perbaikan dan penggantian *part* baru. Perbaikan dan penggantian *part* dilakukan untuk memaksimalkan kinerja *cooling tower*. Hasil dari nilai efektivitas *cooling tower* selama enam hari didapatkan nilai efektivitas *cooling tower* berkisar dari 85,56% - 90,46%. Berdasarkan standar *overall equipment effectiveness* sebesar 85% atau lebih dapat disimpulkan bahwa nilai rata-rata efektivitas *cooling tower* sudah memenuhi standar.

Kata kunci : *cooling tower*, efektivitas, *internal part*, *mechanical equipment*