ABSTRACT

PT Pertamina Refinery Unit VI Balongan, through unit RCC, is designed to process crude oil into refined affordable oil. In the process, Unit RCC operates 24-hour service every day, and also has the capacity to produce as much as 83.000 BPSD. In order to meet the people's demand, Unit RCC requires machine with high performance. Measurements on the machine's performance through a method of reliability, availability, and maintainability analysis (RAM analysis) is important to identify the system's capacity, and to define its business potential method of cost of unreliability is used to see the cost in the troubleshoot of RAM. The main goal of this research is to specify the value of performance reliability by means of using reliability block diagram and calculation on analytical RAM and RAM simulation with the use of software Blocksim 8. At the same time, this research intends to identify the value of Plant Availability Factor (PAF), Cost of Unreliability and formulates recommendation to improve the unit RCC performance.

From this research, conclusion can be drawn that based on RAM analysis with the use of reliability block diagram model based on analytical approach, in 8760 hours, Feed System has the reliability value of 6.19%, Regent System with reliability value of 0.26%, Reactor (4,57%), Main Column Section Combustion Control (13.11%). To calculate with the simulation approach, unit RCC has the reliability value of 0.3% in 3648 hours. The Inherent Availability of unit RCC is 93.47% and 97.44% based on simulation approach. The Operational Availability of unit RCC is 95.32% based on the analytical approach, and 72.37% based on simulation approach. The system has maintainability value within 2-20 days. Based on cost calculation with the use of Cost of Unreliability, the cost due to the unreliability of the machine is $6.810.550 based on active repair time, and $7.178.073 based on downtime. In that sense, the amount of $367.564 is achieved as the cost that the company will receive because of waste, and 13.282,8 hours of time wasted due to the work done apart from active repair.

Based on the analysis of RAM analysis and Cost of Unreliability (COUR) received, increasing the machine's performance can be done by increasing the preventive maintenance program, improving skill, and adding the amount of maintenance crew.

Key Word: *Reliability, Availability, Maintainability, Plant Availability Factor, Cost of Unreliability.*