

## **ABSTRACT**

*PT. Pertamina is one of government corporation (BUMN) that holds the responsibility for the potential use of oil and gas that exist in Indonesia's nature. Moreover, Pertamina is also responsible for utilization of the potential oil and gas, so that Indonesian people can use it wisely. PT. Pertamina (Persero) Unit VI Balongan is sixth of seven Refinery that Pertamina has. By processing the crude oil into more valuable products, RCC unit has become the most substantial unit in PT. Pertamina (Persero) Refinery RU VI Balongan. RCC unit has 83.000 BPSD production capacity. To continue to meet the demands of society, RCC unit needs a good working system. For the needs of a good working system, a proper maintenance strategy needs to be done, especially for RCC unit by using Analytical Hierarchy Process (AHP) methods. Besides AHP methods, Risk Based Maintenance (RBM) is needed to determine the risks and consequences caused by damage to the RCC unit and to increase machine availability can be done by determine the optimal stock of non-repairable spare parts.*

*The result of this research can be concluded that based on Analytical Hierarchy Process (AHP) methods, 45 component from RCC unit critical subsystem is obtained. Based on the chosen 3 maintenance strategy, there is 24 scheduled restoration component, 16 scheduled on condition component, and 5 scheduled discard component. Risk Based Maintenance is performed for determine the risks and consequences caused by a critical subsystems damage of the RCC unit. The risks that caused by the damage of critical subsystem equipment in a year or approximately in 8760 hours are 144,198,267,733.12. Based on the analysis conducted by comparing the risk and risk acceptance criteria, obtained that the risks covered due to damage of critical subsystem equipment in a year exceeds the defined risk acceptance criteria by PT Pertamina. Therefore, the determination of the optimal time interval preventive maintenance is done to reduce the risks caused by the damage of critical subsystem equipment. To increase machine availability, non-repairable spare part calculation is done and that the result is obtained, that there is a procurement of 21 non-repairable spare parts.*

*Keyword: Analytical Hierarchy Process, Risk-Based Maintenance, Preventive Maintenance, Non-Repairable.*