

ABSTRACT

PT. XYZ is one of the biggest petrochemical in West Java. In its production the company processes certain raw materials needed in the manufacture of fertilizers, especially urea fertilizer. The factory of PT. XYZ consists of two units, the Ammonia unit and the Urea unit. The problem faced by this company is the frequent damage to the Lean Carbonate Circulation Pump engine contained in the Ammonia IA unit, resulting in a lot of downtime. The purpose of this study is to determine the performance of the engine and costs of unreliability, using Reliability, Availability, Maintainability, and Cost of Unreliability methods. From the results of the risk matrix, it is known that the system included in the critical category is the pump system, while the subsystems included in the critical category are the pump impeller + shaft, bearing, and mechseal so the research will focus on the three subsystems. Then from RAM calculation, the result of Reliability Analysis at 4800 hours, each subsystem has a Reliability value of 15% for pump impeller + shaft, 9% for bearings, and 40% mechseal. The Inherent Availability Value of each subsystem is 99.93%, 99.88% and 99.98% and the Operational Availability value of each subsystem is 99.87%, 99.91%, and 99.94%. Based on the evaluation that has been done by using the world class maintenance Key Performance Indicator, indicators from the leading and lagging availability have reached the given indicator target. For the calculation of Maintainability value, it is obtained that the subsystem time reaches 100% reliability value is $t = 4$ hours for pump impeller + shaft and bearing subsystems, while the mechseal subsystem requires time $t = 2$ hours. While from the COUR calculation results, the corrective money lost value was Rp 2,495,796,903 and the downtime money lost was Rp 37,787,305,381. Then an assessment of business consequences using a business risk matrix which shows the three critical subsystems entered into the red area indicates that the business consequences caused by the unreliability of the three subsystems are very risky to the company so that it needs attention and further action is taken to prevent higher consequences.

Keywords: Reliability, Availability, Maintainability, Cost of Unreliability, World Class Key Performance Indicator, Reliability Block Diagram, Business Consequence.