ABSTRACT

PT.XYZ is a company engaged in the fertilizer industry on a national scale. The urea reactor is a place where chemicals react before they become urea fertilizer which is ready to be distributed to consumers. Reactor varies in design based on function. In the reactor system, there are 11 subsystem sieve trays, mixing chamber, grounding cable, special valve, nozzle, inlet & outlet pipe, vessel support, manhole, lining, pressure gauge, leak detection system. Risk Based Inspection (RBI) is a method that uses the risk of a tool to plan inspections. The RBI method used is semi-quantitative RBI, which combines the Qualitative RBI and Quantitative RBI methods. The purpose of this study is to determine the inspection interval, the estimated remaining life, and the appropriate maintenance policy for the reactor. By using the Multi Attribute Value, modeling of the decision and decision tree portfolios in the urea reactor is obtained which functions to make optimal decisions. From the results of this study, it can be seen that there are two critical subsystems that fall into the mid-high and high categories, namely lining and special valve. Lining is the focus of this research because it has thickness data that decreases every year due to corrosion and the lowest remaining life of the urea reactor lining in segment 1, namely 2.3 and based on the portfolio decision, the repair option if the lining is close to its lifespan is relining. By doing semi-quantitative RBI calculations, the level of risk in the reactor is obtained, namely the medium and the proposed inspection interval for the reactor is 2 year.