ABSTRACT

Failure Analysis of Mechanical Seals in Centrifugal Pumps Using the Failure Mode and Effects Analysis (FMEA) Method in the Chemical Making Area of PT Indah Kiat Pulp and Paper Perawang.

Name : *Saiful Rahman Siburian*
Studend Id : *2204221415*
Advisor : *Alfansuri, S.T., M.Sc.*

Mechanical seals are important components of centrifugal pumps that function to prevent fluid leakage during operation. Failure of a mechanical seal can cause leakage, pump downtime, increased maintenance costs, and disruption to the production process. This study aims to identify failure modes, analyze failure causes and effects, determine failure risk levels using the Failure Mode and Effect Analysis (FMEA) method, and provide corrective action recommendations for the mechanical seal of a centrifugal pump in the Chemical Area of PT Indah Kiat Pulp and Paper Perawang. Data were collected through observation, interviews, documentation, and questionnaires involving six respondents consisting of one supervisor, two operators, and three technicians. The FMEA results identified seven failure modes with the following Risk Priority Number (RPN) values: Seal Face Crack 301.28, Metal Housing Fracture 205.26, Seal Face Wear 163.16, Rotary Assembly Overheating 119.24, Metal Housing Crack and Corrosion 110.72, O-Ring Failure 89.57, and Sleeve Wear and Scoring 66.62. Seal Face Crack was identified as the main priority for improvement because it had the highest RPN value. The recommended corrective actions include increasing periodic inspections, implementing preventive maintenance, improving the accuracy of mechanical seal installation, and controlling pump operating conditions.

Keywords: *Mechanical seal, centrifugal pump, FMEA, RPN, preventive maintenance.*