OPTIMIZATION OF PREVENTIVE MAINTENANCE WITH PSO (PARTICLE SWARM OPTIMIZATION) ON SEMI LEAN SOLUTION PUMP 107-JC IN FACTORY I PT. PETROKIMIA GRESIK

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Abstract

In producing ammonia, there are stages of CO₂ Removal in the process where there are 3 pumps to drain the solution of Benfield to the CO₂ Absorber. At one Semi Lean Solution Pump, ie 107-JC is often breakdown because a leak in the bearing, mechanical seal, corrosion, high vibration, wear, and process problems. In this research, the optimization method using PSO (Particle Swarm Optimization) to determine the scheduling of preventive maintenance that can increase the value of reliability to the system pumps 107-JC and minimize the costs required to perform maintenance. Selection of pump components is based on the data record maintenance for 4 years (2010-2013) with the intensity of damage more than 5 times. In this optimization process, look for the value of the right time for scheduling preventive maintenance. From the optimization results, obtained scheduling PM is 110 hours. Maintenance treatment of each component pumps is different at each interval. For a span of 110 hours, the value of critical reliability when will be maintenance is 0.645. Over the span of 1430 hours or as long as 2 months, treatment pump with preventive maintenance can keep the pump reliability is always in the range of 0.6 and 1. As well as the costs required for 1430 hours or 2 months is US $ 2,115.95.

Keywords : Preventive Maintenance, PSO (Particle Swarm Optimization), Reliability, Semi Lean Solution Pump