ABSTRACT

PT Pupuk Kujang is a company engaged in the petrochemical sector, and was established on June 9, 1975 within the Ministry of Industry, in the village of Dawuan Cikampek. Based on the results of interviews and existing damage data, the machine that often experiences damage and downtime is the Bingham lean Benfield J1107-C engine which is found in the Ammonia 1A plant. The function of the Bingham Lean Benfield J1107-C machine is to drain the Benfield solution from the striper to the absorber where the Benfield solution serves to absorb CO2 which plays a role in the process of making ammonia, if it is damaged, the factory will shutdown and make the company incur repair costs and cost losses. The purpose of this study was to determine the value of reliability, availability, maintainability, and safety level of each critical subsystem of the Bingham lean Benfield J1107-C machine. The methods used are reliability, availability, maintainability, and safety integrity level. From the results of the risk matrix, the engine critical subsystems, namely pump impeller + shaft, and coupling were selected, so the research focused on these critical subsystems. The existing reliability value for each critical subsystem at t = 480 hours is 76.42% for pump impeller + shaft, 74.04% for coupling, and 56.58% for system reliability. The inherent Availability value of the critical subsystem of the Bingham Lean Benfield J1107-C engine has a value of 99.84%. According to IVARA standards, for the minimum inherent availability value of 95%, the inherent availability value of the Bingham Lean Benfield J1107-C machine is good, because it is above 95%, and the use of the system on the Reliability Block Diagram Operational Availability is worth 99,819%. To achieve 100% maintainability, it takes 25 hours for Pump Impeller + Shaft and 10 hours for Coupling. For the value of safety integrity level is at the level of SIL 2 for t = 24 hours and SIL 1 for t = 144 hours.

Keywords: Reliability, availability, maintainability, safety integrity level, reliability block diagram.