

## ABSTRACT

In the daily life, electricity is a vital thing and something that never released from human activity. Pertamina Geothermal Energy (PGE) is a subsidiary company of PT. Pertamina (Persero) established since 2006 which utilize geothermal resources to generate electricity in Indonesia. PT. PGE Kamojang is the first geothermal field which was inaugurated on January 29th 1983. Total generating capacity of Kamojang Power Plant is 200MW consist of Unit 1, 2, 3 with total of 140MW and 60MW from Unit 4. In Power Plant, there are seven Mechanical Main System which is have important role. The seven system are, Steam Separating System (LBJ), Steam Supply and Venting System (LB), Steam Turbine and Lube Oil System (MA), Steam Return System (MAG), Gas Removal System (MAJ), Circulating Cooling Water System (PA), and Raw Water System (GA). When the seven system is being operated and there is a system fail, then Power Plant cannot be operated. The failure that can occur in the system can be avoided by doing research using RAM Analysis Method and Blocksim 9.0 software. Because with RAM Analysis Method and simulation through Blocksim 9.0 software, the Availability, Reliability, and Maintainability of a system will be known. The last results of this research is also to determine the Critical Equipment in Mechanical Main System.

From this research which is use the RAM Analysis Method and Blocksim 9.0 software, can be seen the Availability of Power Plant is 73,8675% and the Reliability is 68,7% for one month interval and 0,8% for one year (12 months) interval. For the critical equipment if it is based on RS FCI then the critical equipment are PA-BF207 with RS FCI 13,08%, PA-BF109 with RS FCI 12,99%, PA-BF110 with RS FCI 12,21%, MA-STRB with RS FCI 10,26%, MAG-CND with RS FCI 6,51%, MA-GEN with RS FCI 5,03%, and LBJ-SCR with RS FCI 4,04%. For the critical equipment when it is based on RS DTCI then the critical equipment are MA-STRB with RS DTCI 21,16%, MA-GEN with RS DTCI 11,98%, MA-BRX with RS DTCI 6,48%, MA-TRG with RS DTCI 5,55%, MA-GBR02 with RS DTCI 5,23%, MA-MTG with RS DTCI 5,05%, and MA-TBR02 with RS DTCI 5,05%.

Keywords: Reliability, Availability, Maintainability, Reliability Block Diagram (RBD), Failure Mode and Effect Analysis (FMEA), Equipment Configuration, Power Plant