PT.PJB Paiton is an electricity company who use the mill machine / pulverizer to grinding coal before burning it on the burner in order to achieve optimum combustion. PT.PJB Paiton has five mill machines / pulverizer for each unit, it produced 49 804 kg / h /machine of coal dust. Mill machine / pulverizer operation have potential occurrence of internal combustion which can cause the risk of explosion.

This study will discuss the planning of maintenance activities by applying RCM (Reliability Centered Maintenance) II for risk assessment caused by function failure mill machine / pulverizer. For the appropriate maintenance planning, we need to analyze the function failure of equipment. The quantitative analysis is for determining the optimum maintenance interval time by taking into account the cost of maintenance (CM) and the cost of repair (CR). While the BCA (Benefit-Cost Analysis) is used to determine the ratio between the cost of planned maintenance activities and benefits received that are performed after the maintenance activities.

The results of this study is 15 failure mode of mill machine / pulverizer. To anticipate such failures will be given with due regard to maintenance activity RCM II decision diagrams include scheduled on condition, the scheduled restoration, scheduled discard and the combination of tasks. Benefit-Cost Analysis shows that the $B / C = 3.9$ where $B / C \geq 1$, it is expected to improve the effectiveness of the maintenance activities have been planned.

**Keywords**: pulverizer/mill, failure mode, preventive maintenance, RCM II, Benefit-Cost Analysis