

## **RISK MANAGEMENT STRATEGY OF POWER GENERATING OF PT INDONESIA POWER**

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### **Abstract**

PT. Indonesia Power was founded as subsidiary of the state power company, PT. PLN (Persero), that is business and profit oriented, while not entirely neglecting the social mission of the parent company. Having 130 units Power plants in 8 locations around Java Bali island with total capacity 8,978 MW shows that Indonesia Power having an important role. In the other side, Indonesia Power faces high risk concerning in operation their business. Since using gas, oil and geothermal as fuel in producing electricity in condition with high temperature and pressure, high speed machine and high voltage electricity area. Indonesia Power operates many kind of power generating units, Steam Turbine at Suralaya, Semarang, Priok and Perak , Gas Turbine at Priok, Semarang, Bali and Grati, Combined Cycle at Priok, Semarang and Grati, Diesel at Priok and Bali, Geothermal at Kamojang and Hydro Turbine at Saguling and Mrica Power Stations as shown on Figures 1.

Playing a strategic role and facing high risk in operating its business, Indonesia Power has to manage risk affectively to keep the Power Plant reliable. Beside that Indonesia Power shall to maintain their position as a market leader in Java Bali, in according to achieve its Vision to become a world class public generating company.

At the moment, to manage risk, Indonesia Power together with Marsh as the insurance consultant has implement risk transfer to Insurance Company. The insurance is only cover for property damage risk for eight location of Power stations. The cost is high, around 1% in the total of Operation Cost, but the benefit not optimally enough. Since of the losses generally arising out by machinery breakdown with high financial losses. Beside that Indonesia Power have a large number of assets, and that's caused high insurance premium. Predictive maintenance as a strategy of loss prevention for machinery breakdown risk, do not suitable enough for the Power Generating Units, which is 10 years life. The Size or severity of losses arising out by machinery breakdown, have high impact to the Company. And it's generally happened in Thermal Generating Units than Hydro ones. In view of organizing structure of the company, there were a section in each units who handle risk management program. The Risk Management Program has been done, but no synergy for the whole of strategy. The different position in organizing structure, whose handle this matter in each unit, met the difficulties in coordinating and controlling. Controlling and monitoring function have been existing, but low enforcement.

As conceptual on Risk Management study, there were describes an approach to manage risk. Base on the different kind of risk, different kind of level of risk could be manage by the particular strategy. In this paper we categorized risks into five, these are: Human Error (R1), Machinery Breakdown (R2), Property Damage (R3), catastrophe (R4) and Riot & strike (R5). These risks are major risk for power generating units, based on the historical data of losses. There are many methods to manage the risk. Generally, the literatures said that the alternatives Risk Management Strategy are Risk Assumption, Loss Prevention, Insurance, Loss Reduction, and Risk Avoidance. We choose these strategies as the alternative risk management strategies.

In the Risk Management Process, there were five step must be done. Beginning with risk identification, risk evaluation or assessment, dealing risk, implementation of strategy and controlling. Risk Identification could be done by check list of losses from historical data, interview or from risk survey report. From this step, we found the kind of risks, which were impact to the Company. Do the next step we evaluate and assessment

risk with dimension of Frequency and Size or severity. From this step we have map of risk, while we plotted each risk on Frequency and severity matrix. For the entire Indonesia Power, we divided into thermal and hydro generating units. Each Thermal generating unit be combined met the average value as the entire Thermal Generating Units, either than Hydro. In the other side, to dealing risk, we use Risk Management Tools. Risk management tools that Mark S Doorfman describe is the Frequency - Severity matrix which divided into four quadrants, consist of the kind of risk management strategies that we will choose. Cost and effectiveness of strategy we use, will be considered in according to select the proper strategy. At the moment we have difficulties to select which strategy will suitable to manage the particular risk and for the entire risk of Power generating units. Because of the limited data we have and only Frequency and severity of kind of risk. With the Analytical Hierarchy Process as the tools of Decision Making, we could carry out the problem, well. Since of AHP could enter our experience, intuition and though into judgment as one of the consideration factors.

We use AHP with Expert Choice Program in selecting strategy step. First, we define goal and criteria. The Goal of this paper is to select the proper strategy of risk management for hydro and thermal Power plant including the implementation program, based on the condition level of risk, policy and resources of Indonesia Power. Then we build a structure of the problem into detail of elements. There were five alternatives strategy should be select to manage five categories risk, with variables cost, effectiveness and level of risk considerations. Evaluating each strategy to each risk with consideration each criteria / variables have been done by discussing with other personnel. In according to met one value that represent all evaluation, we use aggregate value approach. Enter the judgment have been done by pairwise comparison mode, with numerical type. Then the Program calculated into number of priorities. The priorities then be checked by inconsistency ratio.

In the end of paper, finally we found the priority of the strategy for Thermal and Hydro generating units. Risk management strategy for Hydro PP is Loss Prevention concerning to R3 (property damage) Implementation could improve safety program, housekeeping and training effectively. Managing R2 (machinery breakdown) by Predictive Maintenance. Insurance will be priority on catastrophe risk (R4). Risk management strategy for Thermal PP is insurance concerning to R2 (machinery breakdown) by insurance also to R3 (property damage) including R4 (catastrophe risk). This strategy will be supported by Loss prevention for availability data and reporting documents, and Loss Reduction for providing and availability protections system apparatuses.