ABSTRACT

Construction project performance can be measured by the achievement of the completion of the project according to the fulfillment of schedule, budget and quality requirements. During project implementation process will have problems of uncertainty and the risks of affecting cost estimation of the project. It is necessary for risk analysis to determine the most significant risk factors and plan the cost of the project risks (cost contingency) due to the condition of the construction project which has the potential high risk of event uncertainty. EPC Project was a project where a contractor working on the project includes the design, material procurement and construction. EPC project was a project that quite complicated, complex and faces many problems. The Contractor has consequences to accept a greater risk impact and should be consider the project cost contingency for anticipating the overbudget.

This research aims to identify risk factors affected by the cost contingency at EPC project activities is obtained from preliminary surveys, brainstorming, interviews and questionnaires as well as previous research studies. Risks are analyzed qualitatively to determine the classification level and weight of risk using probability impact matrix and pair-wise comparison. Risk factors with a high risk category are quantified by using Monte Carlo Simulation method to determine project cost contingency.

The research on Project Gas Pipeline Distribution in Jabodetabek show the critical risks on engineering process are approval design drawings, unforeseen condition, scheduling, human resources and material specification. The critical risks on procurement process are approval material, delivery materials, contract agreement, unit price materials estimate and supplier capability. On construction process, the critical risks occurred on construction method, scheduling, human resources, project cash flow and weather condition. The Monte Carlo simulation results show that the average cost contingency is Rp.2,865,572,951 or 3.60% of Total Contract, with a standard deviation of Rp.521,901,231, - or 0.67%. Validation result of the model against to the project actual cost indicate a deviation of contingency cost is 0.53%. Therefore the cost contingency estimation in this research is a realistic model for EPC Project.

Keywords: Risk Analysis, EPC, Monte Carlo Simulation, Cost Contingency