CHAPTER II

LITERATURE REVIEW

2.1. Introduction

Construction project is a type of industry can be an indication that the movement of the economy along with the industries others. Construction industry has characteristics such as (Andi, 2004):

1. Oriented labor
2. Tend to be complex, many parties involved
3. Short duration
4. Each project is unique
5. Built in the field and the environment influenced a lot about
6. Many are influenced by the location and local culture
7. Far too often demand changes

In addition, the construction industry has the characteristic that distinguishes it from other industries, namely (Rosenfeld et al., 1991, taken from Munns, 1995):

1. The people involved in the project work is often temporary.
2. Each project is unique and changing conditions that reduce the results to be achieved by supporting factors that exist.
3. Organizational temporary, and as a result there is no commitment between the client and service providers to build workforce skills and projects.

The uncertainty arises in the construction industry if there is no information about the event, condition, or value in the days to come. Uncertainty can be (Toakley, 1988, taken from Uher, 1996):

1. Ignorance of the identity of the variables or factors which clearly defines a system, or
2. Lack of knowledge of the value of the variables that describe the system. Uncertainty is usually developed into a risk that can be defined as the ability to realize the negative effect of an unwanted event (Toakley, 1988, taken from Uher, 1996).

Risk can also be defined as a gain or economic loss probability events is known, while the probability of uncertainty it was not known (Porter, 1981, taken from Uher, 1996). Risks and uncertainties are inherent in commercial activities from day to day, regardless of industry type, size of the project, and the environment. This is because most of the commercial decisions made under conditions of uncertainty or risk. The risk is almost always there, its presence may not have a problem, especially if a small impact. However, if a big impact, the risk still provide a useful purpose (Uher, 1996).

2.2. Risk Definition

Risk is the most important part of the implementation of risk management because the risk is at the root of the object theory and the problems that used to develop techniques and analysis in tackling the risk itself (Akintoye & Macleod, 1996).

Perception and definition of risk varies depending on one's beliefs, behaviors and feelings and judgments are also included supporting factors include: educational background, practical experience in the field, individual characteristics, clarity of information, and environment influences (Choffray & Johnson , 1977) and (Ritchie & Marshall, 1993).

There are some differences in perception and definition of risk itself, though not too obvious, from the civil practitioner general contractor and project manager, among others (Akintoye & Macleod, 1996):

1. The factors that have adverse effects on the success of the project financially and punctuality, which was the time factor alone can not always be identified.
2. A state of physical and financial contracts became more difficult than it has been approved in the contract.
3. The opportunity to make a profit on the contract, which the client satisfaction, the contract price and time priority resolution.
4. A condition in which the events happen unplanned.
5. Loss of money, reputation and the chance of accidents that affect each individual in the project.
6. The errors in the tender or implementation in the field that triggers degradation, swelling costs and impact on everything that is not unexpected in the project.
7. The possibility of construction activities that cost more than those approved in the tender.

8. The security requirements, ie all the events that have the possibility of accidents.
9. Something that can be transferred or avoided.
10. An activity or activities that have an influence, could have occurred and have a detrimental impact on the planning and costs.
11. Risk is the uncertainty associated with the events and the influential impact on the outcome of the project cost, time, quality, and the various criteria that allow execution.

But every executive in the field of construction generally know that the consequences of the risks that occur more direct impact on clients and results of construction rather than execution (Akintoye & MacLeod, 1996).

2.3. Definition of Risk Management

Risk management is defined as the identification, size, and economic control of risks that threaten the capital and corporate earnings (Spence, 1980). Risk management actions taken by practitioners to respond to a variety of risks. In Shen's study (1997), respondents do two kinds of risk management measures to prevent and repair. Used to prevent action to reduce, avoid, or transfer risk in the early stages of construction projects. While measures to improve is to reduce the effects when the risk occurs or when the risk to be taken.

Risk management is a systematic way to look at risk areas and determine the best solution. Risk management is a goal management tool to identify sources of risk and determine its impact and develop appropriate management responses.

Assessment of the impact of risk is a complex problem and should be done in a systematic approach to elaborate into 5 levels (Uher, 1996):

1. Classification of risk
2. Identification of risk
3. Data collection
4. Risk analysis
5. Response to the risk

Benefits gained by applying risk management, among others (Mok et al., 1996):

1. Allows you to make decisions in dealing with complex problems.
2. Facilitating the estimated cost.
3. Giving opinion and intuition in making decisions that result in a correct way.
4. Allows for decision makers to deal with risk and uncertainty in the real world.
5. Allows for decision makers to decide how much information is needed to solve the problem.
6. Promote the systematic and logical approach to making decisions.
7. Provide guidelines to assist the formulation of the problem.
8. Allows a careful analysis of alternative options.

Based on the research Mok et al. (1996), the respondents considered that the benefits of applying risk management is to facilitate the ultimate cost estimates when they can use the techniques in risk management. The purpose of risk management itself does not need to eliminate the risk. This gives the impression that the existence of risk can be beneficial to decision makers that they can change more risks become greater results. Risk management is widely adopted in many

business situations, including financial evaluation, the possibility to work, planning strategies, the estimated cost, life cycle costs, as well as budget and project appraisal (Uher, 1996).

2.4. Risk Identification

The main step and the most important in the face of risk is to identify them. Many decision makers believed that the principles of good risk management comes from the identification stage than the stage of analysis. This is because the identification of risk involves checking details of the project strategy, through which potential risks can be found and probably drawn a response (Uher, 1996).

Realistic cost estimates of final cost and duration of time a project is usually required as soon as possible. Therefore, the potential risks or uncertainties that may affect the estimates and the obstacles in the project, should also be identified (Uher, 1996).

Risk identification is a process that systematically and continuously carried out to identify these potential risks or loss to property, debt, and company personnel. This risk identification process is probably the most important process, because of this process, all the risks that exist or that may occur on a project, must be identified. The identification process must be done carefully and comprehensively, so there is no risk of missing or unidentified (Loosemore et al, 2006).

Focused on the identification of risk in project management strategies to control and allocate risk, for example through the election relations strategy. Next required further design, development work, as well as clarification (Uher, 1996).

The existence of risk can lead to failure in the cost estimate, the expected completion time, and the expected quality standards. It is important for decision makers to recognize some characteristics associated with risk, some of which are (Toakley, 1988, taken from Uher, 1996):

1. The risks and uncertainties associated with certain events which must be identified.
2. The risk sometimes indicate that there is a result of an event, and every effect has a probability of happening.
3. Some of the risk of adverse consequences, for example the collapse of structures, dispute, or bankruptcy. This low probability but a big impact.
4. Many of the risk of losses due to construction or provide benefits, for example worker productivity, variations in demand, and inflation.
5. For many risks, not enough objective data to make probability decisions. In this case the subjective probability is required.

At this Risk Identification stage, risk managers trying to inventory all potential risks faced. According to Webb (1994) in this task of risk identification can be divided into two categories:

1) The perception of risk: the ability to be able to observe the existence of an exposure (the situations that can cause harm).

2) The process of identification itself. The devices that can be used in the process of identifying risk include:

a) Organisational Charts. From this organizational chart, someone can see a company's organizational structure and relationships that exist between divisions, allowing us to see / detect weaknesses or problems that may arise in every part of the existing.

b) Flow Charts. Flow charts are useful for risk managers where someone can see the flow of material distribution or manufacturing systems in the production process, allowing us to identify the possibilities that may arise in the process.

c) Check List. A number of questions about each item on the Perils or Hazards that may arise within the company concerned.

In practice, risk identification can be done with several techniques, among others (Siahaan, 2007): a. Brainstorming, b. Questionnaire, c. Industry benchmarking, d. Scenario analysis, e. Risk assessment workshops, f. Incident investigation, g. Auditing, h. Inspection, i. Checklist, j. HAZOP (Hazard and operability Studies), and so forth.

Project management in general and in particular the risk management requires a strong sense of history. The use of history can become strengths and weaknesses in this approach. The ability to use intuition to identify and respond to potential risks is an advantage, whereas the fundamental limitation is where every expert believes in personal experience to obtain a list or guide (Uher, 1996).

Probably only the greatest dangers in the use of the data history to identify risks that will come is the occurrence of new never experienced before. The events of the unknown will be more dangerous than any event that has been well documented or have been resolved (Ashley, 1989, retrieved from Uher, 1996).

Ashley (1989) argues that the use of history in the identification of risks to the general form shown in the 2 approaches, namely bottom-up approach and top-down.

2.4.1. Bottom-up Approach

Companies are complex of its operations, diversified and dynamic, it requires a more systematic method to explore all aspects. The recommended methods are; Questionnaire risk analysis (risk analysis questionnaire), the method of financial statement (financial statement method), methods of map-flow (flow-chart), direct inspection on an object, a planned interaction with the parts of the company, statistical records of past losses, and environmental analysis (Dorffman, 2000).

Risk identification bottom-up work with the pieces and try to connect in a sense, a logical way. Examples of this approach is as follows (Uher, 1996).

2.4.1.1. Financial Statement Method

Risk identification method is based on the grounds that the statement of financial calculations give a warning there are a lot of economic loss. Analysis of the statement will show the degree of economic loss that affects the asset. The

weakness of this method is only help a little in identifying the risks associated with construction (Criddle, 1998).

By analyzing the balance sheet, income statement and other records that endorse them, risk managers can identify all the risks pleased with the assets, debts, and company personnel. By combining these financial statements with financial forecast and budget, then the manager will be able to find the risk to be faced, because ultimately the business transaction involves both money and property.

2.4.1.2. Flow Chart

This approach is making flow charts of the actual production process which includes materials, other resources and the end product. With due regard to other elements of the flow chart as well as considering the possibility of something that is wrong with these elements, a number of important risks could be identified. (Ingley, 1962, taken from Uher, 1996).

Method Flowchart can be used to develop the impacts on each period or stage of development. Flowchart Method is then turned into a method of network, if the analysis evaluated the impact not only the direction vertical to the horizontal direction as well. Weakness and method of flow chart or flowchart shows only the flow effects, but the kind of positive or negative impact can not be given. Besides, information about how big the impact is also not given (Kezbom, at.al., 2001)

2.4.1.3. Questionnaire and Check-List

This is refers to the preparation of a list of risks faced by companies in the past and use it as a checklist against which new projects to reduce potential risks. This method is a method of risk identification is more useful to the parties involved in construction with the construction company allowed to identify the risk which he disclosed in a rational way (Mason, 1973, taken from Uher, 1996).

The risks identified in the questionnaire where the risks are based on previous projects or opinions of experts. Along with the questionnaire prepared a check-list of the risks that might be as supportive to ensure there is no risk of missing. The combination of questionnaire and a check-list is a good approach in which risks can be identified either from the past and the future (Bajaj et al., 1997).

2.4.1.4. Scenario Building

This method is by taking previous experience, what happened, how likely that will come. Various alternative measures studied and considering comprehensively with smallest risk, from various aspects before the best decision is taken for all parties (Al Bahar and Crandal, 1990).

Scenario starts from relying on historical data to help identify risks. Two things are developed in general:

1. Scenario where all that happened as expected.
2. Where everything is wrong.

The purpose of this approach is to provide ideas in a structured way about them and negative factors that may affect the project (Uher, 1996).

2.4.1.5. Influence Diagram

Use of influence diagrams can sometimes affect the scenario creation process. By providing income to all possible risks, both positive and negative, the diagram provides a broader view for projects that will come (Ashley, 1989, taken from Uher, 1996).

In the influence diagram, nodal events that have described the major risks in the production process and the line meggambarkan causal relationship between these events. Influence diagram is an effective tool to illustrate graphically the risks, decisions, and all the reciprocal relationship that is important. In addition, the influence diagram is also a tool that illustrates clearly the dependence of probability inherent in the basic probability model (Ashley et al., 1988, taken from Uher, 1996).

2.4.2. Top-down approach

Top-down approach to identify different categories of projects from the examination lists factors that may be important in drawing conclusions at the time will come. Examples of this approach is as follows (Uher, 1996):

2.4.2.1. Case-Based Approach

This approach provides a method of identification by seeking information from previous projects similar to the reference made in the identification of risk. This approach is presented as a good basic training for new managers.

2.4.2.2. Aggregate approach or Bottom-Line

This approach is a technique commonly used in the identification of risk on construction projects. In construction projects, usually given in addition to the contingency percentage is inutisi based on previous project experience. The good news is kesederhanaanya, while the weakness is less able to explain in various ways which are used as the basis for developing risk management response to anticipated problems.

2.5. Data Collection

Identification of risk variables is often difficult to accurately described which may be part of an impact on a project. Will become even harder when determining the quantity of the influence of the risks that have been identified. To analyze the influence of these risks in a project, each variable is projected as a risk to the probability distribution (Uher, 1996).

Data to analyze the risks can be collected objectively by collecting back the data obtained from randomized experiments or subjectively derived from the knowledge possessed today. Betts (1987 and 1991), Ivkovic (1991), and Townley (1991) agreed that the objective data obtained from the documentation is preferred

because it can be felt for consistency and accuracy in the standard probability distribution. Standard distribution is the source of all credible data used in risk analysis (Uher, 1996).

When the data documentation are not available, data must be collected subjectively. Subjectivity of the probability of the data will be prepared by decision makers to base decisions there, implying the ability and experience possessed by the decision maker. The determination of subjective probability is a measure of trust level of uncertainty associated with the actual conditions. The fact that different manufacturers produce kaputusan different possibilities, does not affect the validity of a method, only shows that the risks accepted differently by different people and the resulting probability will indicate their assessment of these risks and their experiences (Uher, 1996) .

2.6. Risk Analysis

The purpose of risk analysis is to describe the effects of the major risks identified from a project. This can be done subjectively or objectively depending on the type of a problem and the availability of objective data. First decision maker must decide which risk analysis techniques to be used. The risks can be described in simple form, does not depend on other things and there is no experiment that can be made to determine the quantity of the probabilities of these influences. The selection of these techniques are generally determined by experience, ability and the computer software (Uher, 1996).

It is the process of digging the information / description is more in the risk have been identified, which consists of:

a. the quantification of risk in the probability and consequences of the aspects of cost, time, and technical project
b. the underlying risk
c. the relationship between risk
d. time when risk occur
e. sensitivity to time (Webb, 1994)

Regardless of which technique is used, the next step required is a decision made by the impact of each risk, and in certain cases, the probability of each risk and the possibilities as a result of a risk. Quantitative methods can be used as tools to assist decision makers but are not suitable to provide a professional decision (Uher, 1996).

2.6.1. Qualitative risk analysis

A qualitative risk analysis is based on a scenario analysis. The purpose of qualitative risk analysis is to determine the source of risk, and initially identified the level of risk to give the impression of a comprehensive systematic risk (Yasin, 2006).

In a qualitative risk analysis, subjectivity is preferred to show the range of uncertainty. Techniques in qualitative risk analysis is as follows (Uher, 1996).

2.6.1.1. Hazard Control Methods Study

This method is based on risk assessment techniques which includes the identification, analysis and response to risks that affect the production, safety, health, and environment. This method is directly related to the following matters:

1. Looking back to safety, health and environment-related projects.
2. Identify and document the events of potential risk, causes and consequences, and safeguards to prevent the occurrence.
3. Check that the building plans in accordance with design expectations.
4. Assessing personal safety, health, labor and environmental safety and corporate policies to meet legislative standards (Walters, 1995, taken from Uher, 1996).

2.6.1.2. Hazard and Operability Study – HAZOP

This technique is seen to systematically design and operation to identify the risks that potential to the community, property, and environment. This technique can also be used to identify operational issues that can affect the efficiency and production. This technique is usually held as a brainstorming training of multidisciplinary teams of relevant experts (Neowhouse, 1993). HAZOP is a technique that is very structured and requires more skilled, time and preparation (Uher, 1996).

2.6.1.3. Engineering Management Confidence

This technique was developed by Jaafari (1990). Engineering Management Confidence is the probability evaluation of a project which failed to reach its objective because of the effects of combinations of risk in the project. The addition allows managers to objectively examine, in an interactive basis, whether the project succeeds or fails according to the estimate that the strategy formulated with the right will minimize the effects of acceptable risk and reduce the probability of failure. Can be assumed that the combined effect of the risks that there could be evaluated subjectively. This subjective assessment should be included in a calculation where the weight of each risk has a value that affects the project in the works. Weights and values developed by managers for each risk, taken into the calculation both of which have the facts of the problems and perceptions of their own managers to the existence and weight of existing risks (Uher, 1996).

2.6.2. Quantitative risk analysis

According to Suharto (1997), quantitative risk analysis based on the logic of qualitative analysis, given the risks from various sources of quantitative indicators of risk and probability, and then through a particular method of synthesis, quantitative values of risk by the system. This is based on qualitative risk analysis based on mathematical processes. Now develop a more advanced method has PRA (probabilistic risk assessment), DPRA (the possibility of dynamic risk

assessment) and the Common Simulation Software Vert (risk assessment techniques) and so forth.

PRA and DPRA is based on quantitative analysis of the FTA, reliability and operating systems are widely used in the field of risk analysis. Slightly modified, we can be applied to project risk analysis field. The analysis steps are as follows:

1. Identify the difficulties of the process of regional development projects, identify sources of risk
2. Examine various sources of risk developed in the project status, and logical relationships to each other, given the risk-source project
3. Identify the consequences of the size of the source of risk, and risk probability
4. Sources of risk through a combination of logic and mathematical methods, and finally get a measure of systematic risk

   When evaluated with DPRA, time yet to consider the relationship between them.

Another method widely used risk assessment Vert. Vert is abroad in the early eighties the development of general simulation software, developed during the project development network, an abstract complex logic for time, cost and performance of triple changes. Network model for decision-making, coordination of processing time, cost, performance and other key parameters of risk, effectively solve multi-objective optimization problem, with great practical value.

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the project development network, an abstract complex logic for time, cost and performance of triple changes. Network model for decision-making, coordination of processing time, cost, performance and other key parameters of risk, effectively solve multi-objective optimization problem, with great practical value. The principle is to enrich the nodes through the logic function to control the flow of time, cost and performance of current activities as appropriate. Each run of simulation, through Monte Carlo simulations, these parameters the flow of probability in networks with different parts of the random flow, through different activities have different changes, and finally to the state final.

This technique is applied to the data includes the projected uncertainty as a range of values that may be. This can be obtained by finding the probability distribution of the actual measurements (eg cost estimation, IRR, net present value) for calculation of various degrees of risk that affect the variables are included. Use of this technique usually depends on the types of problems, knowledge and experience and computer devices. The techniques in quantitative risk analysis is as follows (Uher, 1996).

2.6.2.1. Monte Carlo Simulation

Monte Carlo technique is used where the probability distribution model was applied to determine the simulation of the risks that are relevant in the form of numbers randomly compared with the results of the original data of at least a hundred data. The process of probability by using Monte Carlo analysis is as follows:

1. Make a model of risk analysis.
2. Obtain data and provide an appropriate probability distribution untukmengidentifikasi risk.
3. Choosing a random value of the probability distribution.
4. Calculating the results obtained from a combination of random values.
5. Repeat the last two steps with a larger number to obtain the probability distribution.
6. Entering a value in the form of a function of frequency and the cumulative function (Uher, 1996).

2.6.2.2. Decision Tree Analysis.

Decision Tree is a geometric method that shows the structure of the settlement issue. This structure is made of a set of points and branches, which each represent an alternative branch action or decision (Uher, 1996).

2.6.2.3. Utility theory

Decision theory which includes Expected Monetary Values (EMV) with different decision options. Decision-makers usually choose a decision that has a high EMV value. But if there is a risk in it, decision makers prefer to choose an alternative that has a low value EMV (Uher, 1996).

2.7. Response to Risk

Response to risk is the last element in the risk management approach of an action or series that is part of the decision makers to respond to existing risks. Two general types of response, namely: 1. Transfer of risk, and 2. Control risk (Uher, 1996).

2.7.1. Transfer risk

Relative to control project risk and project risk retention, risk transfer is more effective project risk management tool. For example, to transfer them to the risk of a merger transaction in a professional insurance company or other business institutions of capital, which is consistent and fair rules of market economy, the transfer means. According to former Minister of Construction and Industry and Commerce Administration jointly formulated and formalized (Model Contract for construction), the project owner in consultation with project contractors to insurance co. Today, because of the number of items involved in the actual insurance is less than three large premiums charged by insurance companies is still relatively expensive, and insurance provisions of this contract is clearly not conducive to the project. Increased from year to year as the insured project, while more and more clear that competitive insurance companies, premiums and services will benefit from the project side of the transformation of the transfer of project risk strategy will become more and more perfect and mature (Yasin, 2006).

Transfer of risk is a form of risk management in the form of transfer of the burden of risk from one party to another party. This may be overcome by contractual means by the terms of the contract or by insurance. Transfer of risk in construction projects and contracts usually occurs from:

1. Client to the contractor or designer
2. Contractors to subcontractors
3. Clients, contractors, subcontractors, or designer to the insurance (Uher, 1996).

2.7.1.1. Contractual transfer

This transfer is usually governed by the strength of the individual contract. A client can switch if necessary burden substantial risk to a contractor, and when the contractor has overcome the major contracts, can transfer risk to subcontractors (Uher, 1996).

The parties who accept the transfer of risk is usually respond by entering these risks in a cost estimate with certain ways. Problem for clients is that clients do not know how much that describes the delivery of risk transfer value of that risk by contractors and subcontractors. The greater the intensity level of a risk, the greater the risk that the economic value of the contracts. When determining the economic value of risk is too high, clients will spend a lot of money for the project, and if too low then the contractor or subcontractor will lose money so it can trigger a contract claim, a low-quality work even bankruptcy (Uher, 1996).

The core of the transfer response is that if a risk occurs specifically should be divided between each party to the contract as a reference of each party's ability

to control and reception capacity of each party against the risk-rumor. Abrahamson (1973) formulated the principles of risk allocation in construction contracts. These principles are accepted as an appropriate approach to the allocation of risk (Porter, 1981; Ashley, in 1977; Barnes, 1983; NPWC / NBCC, 1990). Allocation of risk include:

1. Risk in the control of each party.
2. Each party may transfer risk, for example through insurance.
3. The economic benefits of controlling risk lies on each side of the problem.
4. Can improve efficiency, incentives, and innovation.
5. May be impractical to transfer the risk to another party (Uher, 1996).

Davenport (1991) Abrahamson rejected the theory because not all risks can be laid out clearly and the principles of economic theory can not be accepted in general contract law so that practical applications can not be implemented. Davenport argues that the risk and uncertainty is a fact of which the client and the contractor, or both must deal with each other. Davenport recommended alternative is to identify risks and the possible responses of each party to give agreement in the form:

1. Additional time
2. Payment of extra costs
3. Benefits and additional costs beyond a reasonable field
4. Not included in the reasons above (Uher, 1996)

2.7.1.2. Insurance

In the insurance contract, an insurance service users agree, for financial consideration, to assume the financial impact of a risk in a given time (Uher, 1996).

The purpose of insurance is to change the risk (expressed as a contingency) to be fixed costs. In this case the real cost of risk is known. However, not all risks can be insured and the insured, the premium costs taken into account. Thus, a decision maker must take into account how much the ability to pay the insurance premiums after taking it on the basis of possible risks that may affect (Uher, 1996).

According to Suharto (2001), the various risks that can be insured (insurable), among which:

a. Direct damage to equipment and apparatus (fire, accident, damage / loss of materials, equipment, and supplies the project)
b. Losses are not directly related to activities of a third party, (Replacement of equipment, disposal of rubble / debris removal)
c. Legal responsibility (poor product design, design errors, responsibility for the products of the project, failure of performance of the project)
d. Human Resources (Examples include body injuries in the workforce, not the functioning of the core workforce, the labor cost of replacing the nucleus).

2.7.2. Control risk

When the risk can not be transferred for various reasons, management actions necessary to reduce, avoid, or keep (Uher, 1996).

2.7.2.1. Avoid or reduce the risk

When the level of a risk can not be arrested again, the best way is to avoid it. For example, a construction contract that puts the burden of risk is too much causing the bidders (bidders) to cancel a bid. But contractors can not avoid risks if they want to stay in business so they must accept that risk levels and ensure that the benefits greater than the expenses incurred. If the risk can not be avoided completely, the impact should be reduced, for example, reconstructing the strategy, develop alternative solutions even redesign a project (Uher, 1996).

2.7.2.2. Risk retention

The next step is to decide how to control the risks that remain. For the risks that can not be controlled, the contingency fee to be a way out. This can be applied in the form of a single image as an estimate of final cost or time program, in which case the amount of the contingency fee can be described by providing the possibilities that different from the protection against risk (Perry, 1986, taken from Uher, 1996).

1. Single image of the contingency approach has several weaknesses:
2. It is more noticeable as the percentage of images that included arbitrary and inappropriate for a specific project.

3. There is a tendency to double the risk of the estimator value as a tendency to make contingency as an estimate of the individual items.
4. Percentage increase in the estimate of a single picture of the estimated cost / time implies the degree of certainty which it can not be justified.
5. It represents only the damage risk potential of this approach does not highlight the things that is important to reduce the cost / time. This may only be used to hide the low management capacity.
6. Because this is the prerequisite of all the risks of contingency costs / time, tend to direct attention away from the appearance, quality, and the risks of another.

Management may have a degree of control over the remnants of other risks. Control can be used to reduce the influence of a risk and also to reduce the impact if the impact occurred (Uher, 1996).

Core requirements of management to establish a policy effective risk management is to focus on technological and managerial issues as well as the main underlying problems of contractual (Perry, 1986, taken from Uher, 1996). Selection organizational structure, type of contract, and contract selection methods are examples of strategies that need to contract to streamline control risks (Uher, 1996).