

# Risk Management in Construction Industry in Twin Cities of Hyderabad & Secunderabad

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## Abstract

Construction industry is a highly risk prone industry. It has not got a very good track record of coping with risks. Due to this most of the participants experience cost and time overruns and many times fail to meet quality standards and operational requirements. Thus Construction industry practitioners are expected to cope up with challenging risks and need for the same to devise a method of managing these risks. This paper via interview surveys, evaluates the current practices of risk analysis and management adopted by various contractors in Indian Construction industry and to have highly profitable and modern construction industry. The results reveal that in the construction industry, risk analysis and management techniques are rarely used by the general contractors due to a lack of knowledge coupled with doubts on the suitability of these techniques for the construction industry. It is recommended that formal and informal training of general contractors and construction managers is essential for implementing such techniques or else it is wise to recruit engineers who are equipped with better management technique/s. This leads to improved profitability, reduced conflicts and on time / within budget t completion of projects

**Key Words:** Risk analysis, Risk management, Construction, Project management, Contractors

## 1. Introduction

The construction of any project is complex in nature and it is subjected to more risk and uncertainty than any industry. This industry requires a multitude of people with different skills and interests and coordination of a wide range of desperate, yet interrelated, activities. The projects are constructed in the ground but raised in the open space, hence complexity is further compounded by many uncontrollable external factors (Flanagan and Norman, 1983). Sizeable number of projects failed to meet deadlines and targets in respect of time and budget. Clients, contractors, the public and the others have suffered as a result (Edwards 1995). Risk is the potential that a chosen action or activity (including the choice of inaction) will lead to a loss (an undesirable outcome). Risks can come from uncertainty in financial markets, project failures, legal liabilities, credit risk, accidents, natural causes and disasters as well as deliberate attacks from an adversary. Risk management is the identification, assessment, and prioritization of risks (defined in ISO 31000 as the effect of uncertainty on objectives, whether positive or negative) followed by coordinated and economical application of resources to minimize, monitor, and control the probability of impact of unforeseen events.

The risk is then assessed as a function of three variables:

1. The probability that there is a threat
2. The probability that there are any vulnerability
3. The potential impact to the business

In statistics, the notion of risk is often modeled as the

expected value of some outcome seen as undesirable. This combines the probabilities of various possible events and some assessment of the corresponding harms into a single

value. In a formula that can be used in the simple case of a binary possibility (accident or no accident), risk is then:

$$\text{Risk} = (\text{Probability of an accident occurring}) \times (\text{Expected loss in case of an accident})$$

Construction risk is generally perceived as events that influence project objectives of cost, time and quality. Some of the risks associated with the construction process are fairly predictable or readily identifiable; others may be totally unforeseen. Construction risk can be classified in six categories as follows:

- i) Acts of God, e.g. Floods, hurricanes;
- ii) Physical risks, e.g. labour injuries, fire, damage to equipment;
- iii) Financial and economical risks, e.g. inflation, unavailability of funds;
- iv) Political and environmental risks, e.g. changes in rules and regulations, political uncertainty;
- v) Design-related risks, e.g. defective design, and
- vi) Risks due to changes in Bill of quantities (BOQ), e.g. change orders, labor productivity, etc. (Al- Bahar,1990).

Risk is the potential that a chosen action or activity (including the choice of inaction) will lead to a loss (an undesirable outcome). The notion implies that a choice having an influence on the outcome exists (or existed). Potential losses themselves may also be called "risks".

In project management terms, the most serious effects of risk can be summarized as follows:

- i. Failure to keep within the cost estimate
- ii. Failure to achieve the required completion date
- iii. Failure to achieve the required quality and operational requirements

The purpose of risk analysis and management is to help stakeholders avoid these failures (Thompson and Perry, 1992). Risk analysis helps in estimating potential impacts of risk and in making decisions regarding which risks to retain and which risks to transfer to other parties. Both quantitative and qualitative techniques are available for risk analysis. The quantitative methods rely on probability distribution of risks and may give more accurate results than the qualitative methods, if the available data is strong and reliable. On the other hand, qualitative methods depend on the personal judgment and past experiences of the analyst and the results may vary from person to person. Hence the quantitative methods should be given precedence if both choices are available (Ward and Chapman, 1997). Risk management may be defined as a process to control the level of risk and to mitigate its effects. It is a systematic approach for identifying, evaluating and responding to risks encountered in a project (Nummedal et al., 1996).

There are four distinct ways of responding to risks in a construction project, which are:

- i) Risk elimination (e.g. by placing a very high bid),
- ii) Risk transfer (e.g. Hiring subcontractors),
- iii) Risk retention (e.g. via insurance) and
- iv) Risk Reduction by training staff about risk perception and its management)

## 2. Research Significance and Objectives

The cause of not completing and delivering a project within the given budget and specified time might be because of not adhering to the pre-established specifications and failure to foresee the risks and not taking suitable steps to insulate the risks and this results in loss in all respects to all parties concerned. The aim of this study is to evaluate the effectiveness of different risk management practices used by the contractors in the twin cities of Hyderabad and Secunderabad and also to find out the best suitable way of managing the risk in Indian context, so that the project may result in improved quality, timely completion, and reduced conflicts and also improved profitability.

## 3. Methodology

Data for this research was collected by administering a questionnaire survey. Target group of small/ medium/ large companies in Hyderabad and Secunderabad was selected for the study. The questionnaire contained 25 which were grouped in to four separate sections.ii) Identification of critical risks and their impact on cost,

District	Hyderabad	Secunderabad
No.of companies participating	20	15
No.of companies that responded	7	5
Response rate (%)	35	33

Table-1

i) General information of the respondent and company time and quality.

iii) Strategy to handle the identified risks

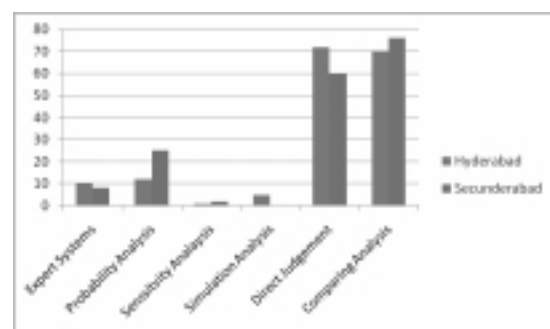
iv) Knowledge and awareness about the availability of risk analysis and risk mitigating response techniques. This was followed by structured interviews (through telephone, e-mail) with professionals in the selected companies. The gathered information was analyzed and results are discussed in the following sections.

## 4. Analysis of Results and Discussion

### 4.1 Questionnaire response rate

The respondents were hailing from top management and also from site offices in the organizations and their qualification, work experience and professional background indicates that all were well aware about the risk consequences from the construction activities.

The response rate is as follows:



Graph- 1  
Evaluation of Risk Analysis Technique  
(Note: % of companies along Y-axis)

Fig1: Responses from Selected Districts about different Risk Analysis Techniques.

From the results it is understood that the majority of the companies (about 72%) prefer judgement techniques to manage the risks involved in construction in the area of Hyderabad where as in Secunderabad 76% of the companies are analyzing the risks through the comparing analysis technique.

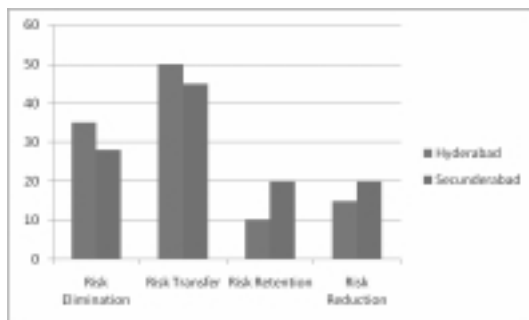
After post data analysis, respondents were interacted to understand for not using simulation analysis with in secunderabad area, and it is understood that as follows:

- 1) The degree of sophistication involved in the techniques is unwarranted if it compares with the project size.
- 2) Companies are not sure about mangement techinques applicability.
- 3) The majority of risks are contractual or construction process related, and are fairly subjective, hence they are better dealt with based on experience from previous contracts.
- 4) Risk management techniques require availability of sound data, which is difficult to collect for ensuring confidence.
- 5) No two projects are similar in all respects.

From the discussion it is premised that companies will complete the projects over period of time, that may range from a one year to three years. But collection of necesary data, analyzation of data may require a couple of months and hence the companies are not inclined in investing their time in understanding the risks and how to mitigate the risk.

**4.3 Evaluation of Risk Reponse Practices**

In the questionnaire the respondents were asked which risk method(s), their respective compnaies employed. The responses to the four principal methods i.e Risk elimination, Risk transfer, Risk retention and Risk reduction are summarized.



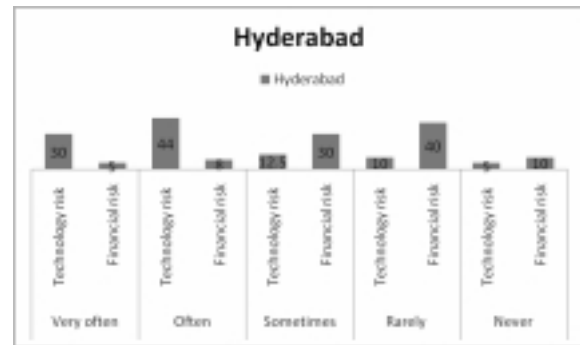
Graph - 2

Responses from selected districts about different risk response techniques

Note: Percent of firms employed that technique % alongy-axis

The results reveal that risk elimination and risk transfer are the two most favorite response methods employed by the general contractors in Hyderabad and Secunderabad. Risktransfer either to a specialty subcontractor or through financial means such as insurance was also investigated. The general contractors in Hyderabad construction industry use

both methods but favour transferring the risk to a specialty subcontractor when the expected loss is higher. When the construction firms are not in position to do Research and Development (R & D) then they transfer the risk of R & D to the outside party or any other subcontractor and also it is understood that if this R&D is done by individuals they may



Graph- 3

Amount of use of the two methods of risk transfer in Hyderabad

Note: Response rate in percent along the y-axis

From the above figure it shall be interpreted that ths construction companies transfer techonology risk often (about 44%) to other contractors or sub-contractos and rarely (about 40%)to the contractors or subcontractors lose completion time and also it may leads to low productivity, poor quality and project delays.

**5. Limitations of the study**

The study was confined to twin cities of Hyderabad and Secunderabad only.

**6. Recommendation**

The professional shall be exposed to the management techniques through informal education (like risk management awareness program) and training modules (construction project management).

**7. Conclusion**

The risk analysis and management techniques are rarely used by the Hyderabad construction industry due to the lack of knowledge and expertise. The industry is not sure about the techniques and its suitability to construction. The contractors perceive risk based on their experience and judgment.

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**References**

1. Risk Management published by School of Distance Education, NICMAR

2. Adler, T.R.; Leonard, J.G.; and Nordgren, R.K. (1999). "Improving risk management: moving from risk elimination to risk avoidance". *Information and Software Technology*, Vol. 41, pp. 29-34.
3. Syed M. Ahmed, Ph.D. & Salman Azhar, M. Eng. (2004) "Risk Management in the Florida Construction Industry", Second LACCEI International Latin American and Caribbean Conference for Engineering and Technology.
4. Al-Bahar, J.F. (1990). "Systematic risk management approach for construction projects". *Journal of Construction Engineering and Management*, 116(3), pp. 49-55.
5. Associated General Contractors. (2000). US contractor's directory, AGC, 333 John Carlyle Street, Suite 200, Alexandria, Va-22314.
6. Baker, S.; Ponniah, D.; and Smith, S (1997). "Risk response techniques employed currently for major projects", *Construction Management and Economics*, Vol. 17, pp. 205-213.
7. Carter, R.L., and Doherty, N.A. (1974). *Handbook of risk management*, Kluwer-Harrap Handbooks, London.
8. Edwards, L. (1995). *Practical risk management in the construction industry*, Thomas Telford, London.  
Flanagan, R., and Norman, G. (1993). *Risk management and construction*, Blackwell, Oxford.
9. Hertz, D.B., and Thomas, H. (1983). *Risk analysis and its application*, John Wiley and Sons, Inc., New York.
10. Kelly, P.K. (1996). *Team decision-making techniques*, Richard Chang Associates, Inc., USA.