

# RISK MANAGEMENT IN METRO RAIL CONSTRUCTION

SUNIL KUMAR

Under the Guidance of

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## Chapter-1

### Introduction:

Risk management is an essential and integral part of project management in major construction projects. For an infrastructure project, risk management can be carried out effectively by investigating and identifying the sources of risks associated with each activity of the project. These risks can be assessed or measured in terms of likelihood and impact. The major activities in metro construction consist of feasibility studies, design, traffic diversion, utility diversion, survey works, piling works, precast segment works, launching of girders and segments, soil and rock excavation, construction decks, steel struts, rock anchors, sub-floor drainage, other services works, waterproofing, permanent structure works, mechanical and electrical installations, backfilling and restoration works.

## Pile Construction process using piling rig machine





**Pile cap Construction**

**Launching of U-girders**



## **Literature overview:**

### **According to**

#### **1. Almishari and Jannadi (2003)**

They explained Risk as a measure of the severity, chances of occurrences and vulnerability to hazards for any activity. According to Almishari and Janna 2003 in project there is always a probability of things will not happen exactly as we planned. Thus risks in project associated to the chances of uncertainties of the cost, schedule and technical abstract.

**2. Mulholand and Christan (1999)** Revealed that because of the criticalness and zestful environments of the construction projects, irrefutable occurrences are created which turned into risk. Which risks are gathered by time constraints. Dey (2001) Revealed that in a Project Management for the Indian petroleum industry he introduced risk management into the standard project management model and reproduced it as an essential part of project management.

But Dey (2001) revealed the analysis of risk by way out the respective chances of the known risks which were found to have a totality of one for the particular work on a local %age (LP). The totality of the chances of all the concerned work was intended to be equivalent to one . on a global %age (GP) basis.

**3. Walker willians and Dorofee in (1997)** they have worked on developing means by which risk management can comes into real practice. Their methods was build on software intensive programs (SEI) . which could help in identify many risk management modes. which can be put into real practice. Critical infrastructure projects like the construction of an elevated corridor for metro rail involve risks in all the phases starting from the survey phase to the running phase. Such risks have a major impact on the project cost and performance.

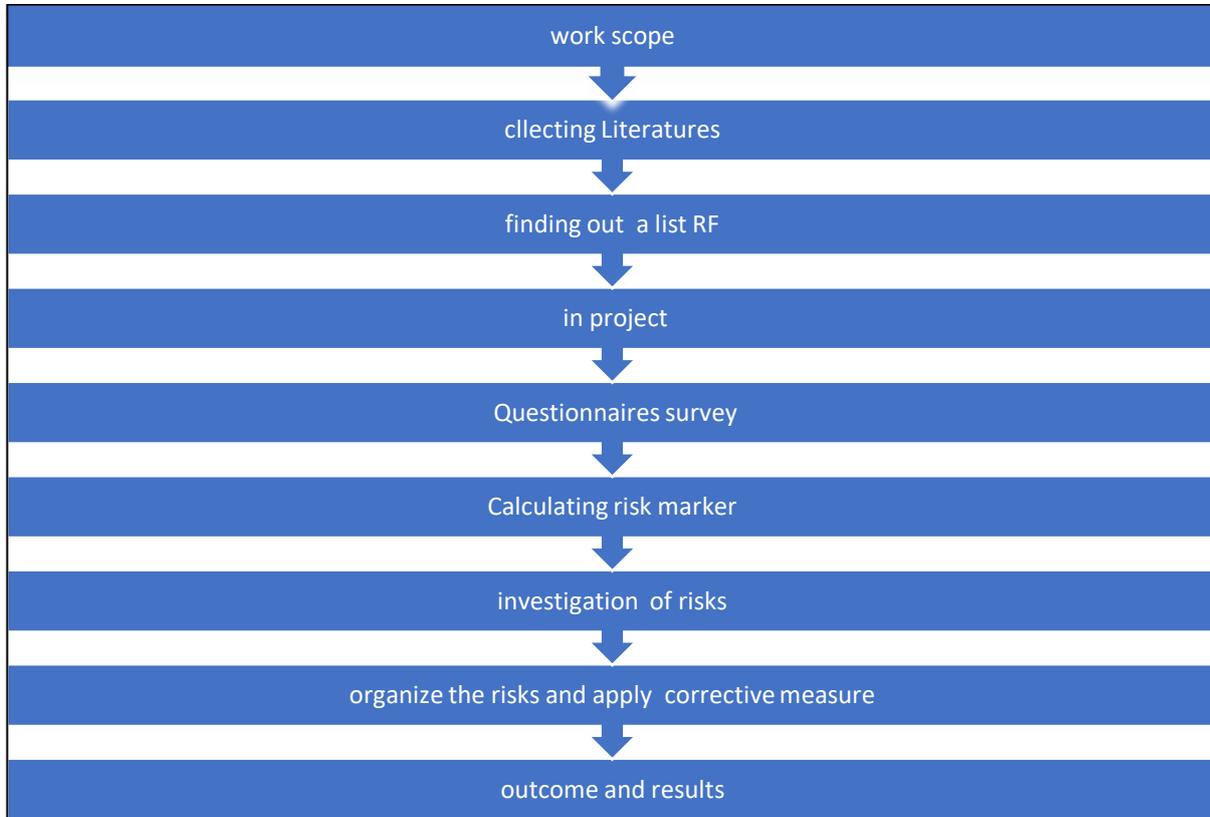
**4. Reilly (2005), Reilly and Brown (2004), Sinfield in (1998)** carried out their research on UG Metro projects. Reilly and Brown (2004) revealed that UG tunnel projects are are very critical projects with so many uncertain ground conditions. According to Reilly (2005), for a critical infrastructure project such as underground construction, it is most important to picked up the risk in the very beginning phases of the any project. A risk mitigation or elimination plan, if developed for the identified risks, will ensure best achievement of project targets in specified time, quality and corresponding cost parameters. it would also helps in achieving better construction safety throughout the construction and final operational phase of any construction project.

## **BACKGROUND**

### **Project Objectives :**

- To find out risks involved during the construction of metro Rail Elevated Viaduc
- To find out the Risk Factor in metro construction by means of conducting questionnaire survey.
- To develop a methodology which will serve as a tool and explain how several risks can be managed.

- To develop an efficient risk management system in the metro rail project.



		CONSEQUENCE				
		1	2	3	4	5
P R O B A B I L I T Y	1	LOW RISK			MEDIUM RISK	
	2	LOW RISK		MEDIUM RISK		
	3	LOW RISK		MEDIUM RISK		HIGH RISK
	4	LOW RISK		MEDIUM RISK		HIGH RISK
	5	LOW RISK		MEDIUM RISK		HIGH RISK

RISK MATRIX

**Consequence**

(The increasing category will always be considered)

Merits	Personnel hazards result	Assets / Progress Hazards result
5.0	Sole or many Fatality	Calamitous Damages, Dangerous Delay
4.0	Thoughtful Injury requiring hospitalisation	Main Damages, Serious Delay
3.0	Lost Time Accident	Serious Damage, Modest Delay
2.0	Injury requiring Medical Treatment but not Lost Time	Modest Harm, Minor Delay
1.0	First Aid treatment only	Slight Harm, No Delay

**scope in future:**

There is enormous scope of metro rail construction in India as it is a second country in the world after China which has most population. and also fast developing country in the world. There is risk involved in every work particularly in infrastructure projects like metro rail construction there will be major number of uncertainties because of its wide scope and cost. This study shall reveal the formless consultation modes as the construction scope is huge which concludes the summary of the risk management analysis in the metro rail upcoming projects.

. This learning shall emphasis on how the construction industry is involving to take the attention of risk management in organization projects. As a coin has two flips , risk is also having two flips which is undesirable and positive. This learning shall reveal how the risk management analysis has to be done and how they are affecting the project. The learning of Risk management analysis is to classify the new approaches to contrivance effectively in the construction industry particularly for the substructure projects as the huge scope and the cost are involved.

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