

# Risk Analysis And Mitigation In Precast Sector.

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**Abstract** – As the precast companies are getting strong response in construction industry due to their five nine accuracy in time and quality. They offer infinite options in design and architecture for on-ground, underground, onshore, offshore etc. constructions with minimum wastage of materials. In order to gain these achievements it has to go through many unexpected risks which sometime may cause serious escalation in cost of project and huge delay of time. In order to avoid such circumstances we have to be pro-active and have all the tools and methods to overcome the risks. In this research paper we will look after all the risks which hinder the precast projects, and, methods to overcome those risks.

**Keywords** - Risk, Precast construction method.

## I. INTRODUCTION

Risk is an event which may occur or may not occur leading to loss of time cost and quality.

The precast element-by-element construction method is a massive team work output. Various departments such as design, production, quality, transportation, erection and all interconnected by planning and co-ordinating department are a part of successful precast project.

The design team after getting all the soil and ground test results give their design script to detailing team and detailing team releases the various drawings of the project using suitable software like BIM-TEKLA etc. Each element is given different Id's with respect to their type and location. Further these drawings are distributed among various departments.

Once the production team get there production plan and related drawings, they start there mould fabrication work in parallel to steel cage preparation. After completion of placing sleeves and final lifting hooks, concrete casting is done.

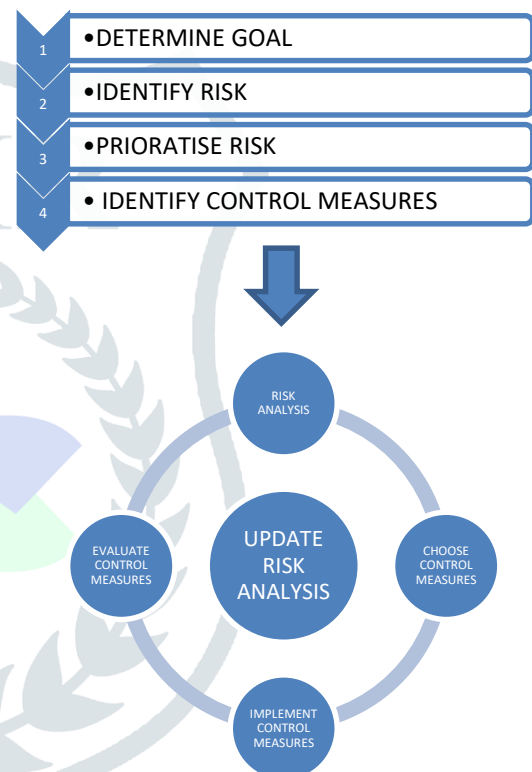
Quality department is involved at every step of production, all the mentioned activities are performed after approval of quality department like mould fabrication, steel cage preparation, concrete supply, pre-concreting, during concreting, dispatch.

Once elements are to dispatch, then transportation team receives list of elements to be loaded in carrier according to weight of element and capacity of carrier. And the same team is supposed to unload the elements from the carrier once it reaches the site stockyard.

Erection team in accordance with erection sequence plan and availability of crane, installs the element at its position and grout it with grouting material after matching the sleeves of neighbouring elements.

All these activities are associated with n number of risks which affect the project cost and time sometimes leading to termination of project before completion. These risks mainly arise due to inefficiency of machinery, human negligence, constitutional amendments, weather and climatic change, natural calamities, poor management etc.

## II. METHODOLOGY



## III. RESULT AND DISCUSSION

The goal was to complete the project in given constraints i.e. "Time, cost and quality" and dealing with all the risks pro-actively related to project.

The risks identified are as follows -:

### A. TECHNOLOGICAL RISK

1. Break down of machineries.
2. Loop holes in design and drawing.
3. Quality compromise in material.
4. Software error.

### B. ECONOMICAL RISK

1. Increase in material price.
2. Poor overhead allocation.
3. Change in tax policy.

**C. LEGAL RISK**

1. Change in laws.
2. Land disputes.
3. Contract misinterpretation.
4. Resistance from neighbourhoods.
5. War like situation.

**D. TRANSPORTATIONAL RISK**

1. Delay in arriving of vehicle.
2. Accident.
3. Damage to elements due to poor driving or any other reasons.
4. Penalties by RTO.

**E. RISK ASSOCIATED WITH HUMAN**

1. Accident causing injuries to any human being.
2. Accident causing death of any human being.
3. Extreme weather conditions.

**F. BUSINESS RISK**

1. Competitive market.

Further we need to prioritise the risk and the priority list was prepared by allotting marks to each risk out of 10. The risk factor increases in the order 0 to 10.

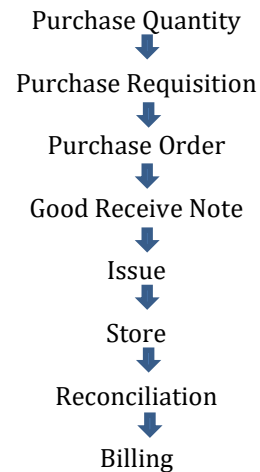
RISK PARTICIPANTS	1	2	3	4	5	TOTAL	PRIORITY
A	6	8	4	6		24	II
B	4	2	2			8	V
C	2	2	5	3	1	13	IV
D	7	4	6	3		20	III
E	10	10	5			25	I
F	3					3	VI

As the points guide, the priority will be in increasing order of points, the priority is as follows :-

- Human risk
- Technological risk
- Transportation risk
- Legal risk
- Economical risk
- Business risk.

Now, after identifying and prioritising the risk, we need to list the control measures for the particular risk or group of risk, the control measures are as follows :-

- Safety induction and PPE for each and every worker and employ in order to aware them about their safety and follow the "SAFETY FIRST" mantra.
- Organising regular technical training for staff and ensure they are updated about the technique which they are using.
- Regular servicing of all the equipment's in use and maintaining the fitness profile of equipment.
- Proper and effective procurement system such as



- On-ground reports must be in sync to avoid software errors.
- Systematic organisational structure in order to distribute the roles and responsibilities, and, the person to report.
- Some of the risks related to cost of the project can be mitigated by insuring the project like "CONTRACTOR'S ALL RISK INSURANCE", "MARINE INSURANCE", and "ERECTION ALL RISK INSURANCE".
- Deploy efficient team such as team having blende of young, old and growing employees.
- Contract documents must frame such a way that it avoid any kind of misinterpretation, and should have each and every detail about the contract.
- A healthy relation and trust between employer and employ can avoid hidden risks.
- Deploy quality department to inspect the activities of every element from very first stage.
- Try to deliver the project on time as per client requirements to withstand the market competition.

**IV. CONCLUSION**

Risks in construction industry may arise at any point and from any direction. So, concluding that only above mentioned risks will arise is impossible, but, major of risks can be mitigated from this theory. An open and presence of mind of the workers and employees related to project can avoid any kind of risk.

Further every project have different risk and considering all task risks must be enlisted. Consult various departments to get details about the project in depth and that results in perfect blende of risk.

**V. REFERENCES**

<http://www.precastindia.co.in/>

<https://www.theirm.org/>

PIIPL, pune, india