

## PROJECT RISK MANAGEMENT

### A Primer for EPC Project Managers



Project management literature has recorded the dismal failure rate of industrial projects over the years. Failure is defined as a project that significantly misses its objectives either in budget, schedule, or operability. The literature also records that those projects which properly perform project risk management have a much better performance than those which do not. The key word here is “properly”. In recent years project risk management has been a requirement of most major projects. The Project Management Book of Knowledge Guide (PMBOK) describes project risk management (PRM) as being an integral part of project management. So if we have the procedures well defined, why is PRM so poorly executed in many of our projects?

PRM is practiced by all mature project management organizations. Owner companies will usually require it in their Invitation to Bid for major projects. Modern risk management principles and methodology were developed by NASA in the 1960’s. It has been increasingly practiced in the Oil & Gas Industry since the 1990’s.

First, we must define risk in the context of project management. Risk is an uncertain event that may or may not occur that could have an impact on project goals if it does occur. The impact of the event may be positive or negative. The purpose of PRM is to mitigate the likelihood of a negative event and to enhance the likelihood of a positive event. Project goals are the schedule, budget, and operability of the plant. Operability of the plant means that it starts up and meets design production and efficiency within a reasonable period of time.

There is a famous quote by Charles Tremper – “The first step in the risk management process is to acknowledge the reality of risk. Denial is a common tactic that substitutes deliberate ignorance for thoughtful planning.”

In the urgency of “getting on with business”, owners and contractors have a tendency to do an improper job of project risk management.

#### SO WHY DO WE NEED PROJECT RISK MANAGEMENT (PRM)?

- All projects have risks. Small projects have small risks. Large projects have large risks. Mega projects have mega risks. PRM must be executed to address the size of the project and risk.
- Risks can impact project goals.
- Unmanaged risks result in crisis management.

- PRM is a tool that allows us to anticipate risks and take action to mitigate them.
- PRM is an integral part of project management.

#### WHO NEEDS PRM?

- Executive Management
  - ✓ To understand the level of risk on a project
  - ✓ To make the organizational commitment
- Project Management
  - ✓ To understand the value it brings to the project
  - ✓ To understand how to implement PRM
  - ✓ To use it as a tool for decision making
- Project Team Members
  - ✓ To understand what risk is
  - ✓ To recognize and identify risk

There are two types of project risk. There are opportunities which – if they occur- will have a positive impact on project goals. When we think of project risks we typically think of threats, which will have a negative impact on project goals if they occur. Both opportunities and threats can be treated in the same manner.

There are at least six Critical Success Factors (CSF) in PRM. Without these factors the effort will be less effective.

1. Organizational commitment: PRM requires a commitment of resources that include personnel and time. The commitment of these resources will minimize the need of other resources for crisis management if risks are not addressed.
2. Recognition of the value of PRM: Personnel from executive management down to the individual project team members need to have an appreciation of the value of PRM.
3. Integration with Project Management: The requirement of PRM should be addressed in the Project Execution Plan and championed by the Project Manager.
4. Individual commitment and responsibility: Project team members will draw from their personal project experience to contribute to the effort.
5. Open and honest communication: All project team members should participate.
6. Scale PRM to the size and complexity of the project: A smaller or less technically challenging project will not require the effort of a major project.

PRM is a systematic process consisting of five basic steps.

1. Planning: The Risk Management Plan will be developed and implemented by the project risk manager. It is completed early the project and defines who does what and when. It considers all stakeholders. The elements of the plan include:
  - a. Defines the methodology
  - b. Tools and templates available
  - c. Risk categories to be considered
  - d. Roles and responsibilities of stakeholders
  - e. Criteria and thresholds for the analysis

- f. Frequency of review of the Register
2. Risk Identification: This will be a brain storming session facilitated by the project risk manager and including project team members, as well as subject matter experts and stakeholders, as appropriate. The deliverable from the risk identification effort is the risk register draft. The draft will list the description of each identified risks and the appointed risk owner.  
Risk identification tools include:
    - a. Management plans
    - b. Scope of work document
    - c. Project estimates
    - d. Risk breakdown structure
    - e. Risk checklist from similar projects
    - f. Lessons learned from similar projects
    - g. Each individual's experience
  3. Risk Analysis: This activity determines the priority of identified risks. The highest impact risks will be the primary focus of the team. Others will be proactively managed while lower priority will be monitored. The process assesses the probability, schedule, and cost impact. From this information the risk score and factored cost impact is calculated to determine the priority of each risk. The deliverable from this exercise is an updated risk register.
  4. Risk Response: Based on the data from the risk analysis, a risk response plan is prepared which focuses on the high priority risks. The cost benefit of each response is determined. Options will be developed to mitigate the probability and/or the impact of the risk or to enhance the probability of an opportunity.
  5. Risk Monitoring and Control: When the Plan has been implemented it is necessary to regularly review and update the risk register. As the project progresses risks will be closed or mitigated while new risks will be identified. Probability of some risks will be reduced as the project progresses. Others will pass the point in the project when they would have an impact and can be closed. Control requires that the risk register be reviewed regularly. This enables us to influence the outcome of chance events.

Various strategies are available to us for mitigation of threats including the following.

- Avoid the threat by changing the scope, extending the schedule, or adding resources.
- Transfer the threat through insurance.
- Early action to reduce the probability or the impact of the threat.
- Acceptance by establishing a reserve.

Similar strategies can be used to enhance opportunities.

- Take action to eliminate the uncertainty of the opportunity.

- Identify the key drivers for the opportunity and modify the plan to remove the uncertainty.

In Conclusion:

- Remember that PRM is as much art as it is science.
- Fit the methodology to the size and complexity of the project.
- Start with a good plan.
- Commit to the process.

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