LECTURE 12

Schedule Risk Management

OUTLINE

- REVIEW LECTURE 11
- INTRODUCTION
- WHY DO PROJECTS FAIL?
- RISK IN CONSTRUCTION PROJECTS
- SCHEDULE RISK TYPES
- RISK SHIFTING/TRANSFER IN CONTRACTS

Delay and Claim

INTRODUCTION

The purpose of this lecture is:

To provide an overview of risk management and the assessment process as well as best practices for incorporation of risk management into CPM schedule development and maintenance

INTRODUCTION

Schedule risks are both threats and opportunities to the success of a project.

- Threats tend to reduce the success of meeting the project goals
- Opportunities tend to increase the success

WHY DO PROJECTS FAIL?

- Generally, from poor risk management
  - Failure to identify risks
  - Failure to actively/aggressively plan for, attack and eliminate "project killing" risks
- Risk comes in different shapes and sizes
  - Schedule risks (short to long)
  - Cost risks (small to large)
  - Technology risks (probable to impossible)

RISK MANAGEMENT INTRODUCTION

Risk management is

The process of identifying, analyzing, qualifying and quantifying the risks, and developing a plan to deal with them.

RISK IN CONSTRUCTION PROJECTS

- Project Managers instinctively develop a lessons-learned list of historical risks and take steps to minimize their exposure to those risks in the future.

- Risks vary by industry and even by construction project type as well as by personnel involved with the project

- A roadway/bridge project has a different group of risks than a facility or building,

- The selected contractors may have different degrees of influence on the level of risks to performance.

SCHEDULE RISK TYPES

1. General duration uncertainty
2. Specific risk events
3. Network logic risks that exist or are increased as a result of the activity relationships

SCHEDULE RISK TYPES

1. **General duration uncertainty is the risk resulting from these conditions:**
   - The durations estimated by the stakeholders ARE INACCURATE or are BASED ON ASSUMPTIONS NOT NECESSARILY ACCURATE
   - The critical path identified in the deterministic approach (everything that has and will occur in the system) may not be the same as the probabilistic critical path when risks are incorporated into the schedule

SCHEDULE RISK TYPES

2. **Specific risk event:**
   - Specific risk events are potential impacts on the schedule that may or may not occur such as accidents and other events that are hard to predict.
   - Additional scope of work activities that may or may not happen, activities that are present in the schedule but may require unplanned multiple cycles to complete, or activities that have significant variability

SCHEDULE RISK TYPES

3. Network logic risks:

Network logic risks are those that generally occur as a result of project management decisions made about the sequencing of activities determined by the activity relationships.

Some Risks

- Weather changes
- Different productivity
- (Sub)contractors are
  - Unreliable
  - Lack capacity to do work
  - Lack availability to do work
  - Unscrupulous
  - Financially unstable
- Late materials delivery
- Lawsuits
- Labor difficulties
- Unexpected manufacturing costs
- Failure to find sufficient tenants
- Community opposition
- Infighting & acrimonious relationships
- Unrealistically low bid
- Late-stage design changes
- Unexpected subsurface conditions
  - Soil type
  - Groundwater
  - Unexpected Obstacles
- Settlement of adjacent structures
- High lifecycle costs
- Permitting problems
- …

Importance of Risk

- Much time in construction management is spent focusing on risks
- Many practices in construction are driven by risk
  - Bonding requirements
  - Insurance
  - Licensing
  - Contract structure
    - General conditions
    - Payment Terms
    - Delivery Method
    - Selection mechanism

IMPORTANCE OF GOOD CPM SCHEDULING PRACTICES FOR RISK ASSESSMENT

The efficient way to evaluate and analyze those risks is

Good CPM scheduling practices include capturing the full and complete scope of work in the schedule by using a work breakdown structure (WBS)

RISK SHIFTING/TRANSFER IN CONTRACTS

Contract language may have a significant impact on how much of the risk each party carries.

- Contracts are often used to control or assign risk to various parties, or just to assign it to a party other than the owner.
- One example of this risk shifting is the use of clauses stating ‘‘that geotechnical reports and information” are provided to bidders for information only, and the owner is not responsible for any usage or interpretation of the geotechnical information

RATIONAL APPROACH TO RISK

a rational approach to risk allocation can proceed based upon the following general principles:

- Risk should be assigned to the party who can best control it.
- Risk should be assigned to the party who can bear the risk at the lowest cost.
- Risk should be assigned to the Owner when no other party can control the risk or bear the loss.
- Assumption of risk by the other parties to the construction process results in increases in cost (visible or hidden) to the Owner.

APPLICATION IN SCHEDULING

a rational approach to risk allocation can proceed based upon the following general principles:

- Risk should be assigned to the party who can best control it.
- Risk should be assigned to the party who can bear the risk at the lowest cost.
- Risk should be assigned to the Owner when no other party can control the risk or bear the loss.
- Assumption of risk by the other parties to the construction process results in increases in cost (visible or hidden) to the Owner.

Question

Terima Kasih