DEPARTMENT OF CIVIL ENGINEERING

Mid Assignment/ Quiz(Spring 2020)

Subject: Risk and disaster management in construction

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Q1.Considering the Bus Rapid Transit (BRT) Peshawar, What were the risks involved during construction associated with the technical aspects of the rapid project? Support your answer with logical and factual arguments along with references. State how we could counter the risks associated with the technical aspects. Hint: you can take help from book "Risk and insurance in Construction" by Neal G. Bunni.

Ans: **Risk**

- The concept of risk can be linked to uncertainties associated with events. Within the context of projects, risk is commonly associated with an uncertain event or condition that, if it accurse, has a positive or a negative effect on the objectives of a project.
- Risk originates from the Latin term risicum, which means the challenge presented by a barrier reef to a sailor.

Construction projects are very complex and can pose various internal and external risks. A strict set of codes, laws, and regulations must be followed during the construction process to best avoid these risks. Unfortunately, there is no way to completely avoid risks as there are bound to be unknown factors that arise over the course of a project. One of the best ways to manage risks is to know the various types and how you can manage them. If you can identify and categorize risks before you start a project, you can optimize you risk management and avoid any possible losses.

Organizational risks

- Inexperience staff assigned
- Losing critical staff at crucial points of the project
- Insufficient time to plan
- Unanticipated project manager workload
- Net enough time to plan
- Priorities changes on existing program
- Inconsistent cost, time, scope, and quality objectives

It is important to capture all potential risks in a project and undertake all necessary actions or make provisions for eliminating or preventing them from accruing. Alternatively, the effects of risks may be reduced and allocated to the party best prepared for managing them. This requires a systematic approach to risk management.

Risk involve during construction associated with the technical aspects of the project

In above definitions we define that risk is uncertain events or conditions so ethnical means involving the sorts of machines, processes, and materials that are used in industry, transport, and communications.

Extended duration of construction

In most of the projects it seen that when the duration increase for project, greater chances of hazard can occurs because project exposed to averment for risk occurrence, where BRT extending from 6 month to 2.8 years.

However, in certain circumstances, there are seasonal hazards which occur at specific times of the year and thus require special consideration if the period of construction is to be extended. These hazards include rainfall, temperature changes, flood, storm and wind. To illustrate this point, the example of BRT Peshawar may be cited. It is a project in very cojjusted area which is exposed to every type of accident such as vehicle accident, traffic jam machinery fail, guarder fall and heavy rain, due to BRT Peshawar, traffic every time jam in few areas vehicle accidents occur and also due to time extension budget increase from 10billion to 90billion because of devaluation of Pakistan ropes. Now, the contractors attempted to rectify the level, but in doing so he spent more time.

Risk involved during construction BRT Peshawar associated with technical Aspect

construction is a risky business each construction is unique and comes with its own set of challenges and risk like BRT. Identify and managing risk can be trickily while starting project identifies the risk unique to your project. There are many risk involved in construction i-e uncertain productivity of resources, weather or seasonal implication and industrial relation problem. The risk maintained earlier may or may not affect BRT. The main risk that may effect BRT technical risk.

- ### Technical risk include

  Poor design, inadequate investigation, and uncertainty over the source and availability of materials and appropriateness of specification. These technical risks must keep under consideration while starting BRT project Peshawar. Further more technical risk that may affect BRT project is given below in detail.

- ### Design process

  1. The main risk involved to BRT as technical aspect owner involved in design
  2. Second one is inadequate and in complete design
  3. Wrong selection of material
  4. Negligence in seismic criteria
  5. Need of design accepting
  6. Error in completion of structural/ geotechnical foundation

- **Construction Risk**
    1. These risk include inaccurate contract time estimate
    2. Procedure
    3. Construction occupational safety
    4. Work permission
    5. Worker and sign safety

- **Environmental Factors**
    1. Environmental analysis incomplete or wrong
    2. Wetland offsite or onsite
    3. Hazardous waste
    4. Lack of specialized staff (biology, anthropology, archaeology)

- **Counter Risk**

    It is necessary for BRT project that technical risk that involved to BRT are identify in time, when you have identify the potential risk to BRT project, then you need to sit down and asses each risk and try your best to avoid risk or mitigate. High probability risk should be handling first. While risk with a law probability and low impact can be tackle last.

    Now that you ranked each risk, carefully receiver each one and determine if you can avoid, eliminate, reduce, transfer, or accept each risk to avoid the risk mean negotiating the contract to remove the risk while transfer the risk keep in mind that you construction company is not right choice to manage risk of BRT mitigate the risk means eliminate, reducing, and accepting risk, so mitigate the risk your company must take carefully planning.

All parties of Construction Company and individual of BRT project must require a high level of collaboration and communication for good risk management of BRT.

References

- Medeiros, JA, and Rodriguez C.L (n.a)
- Project management institutes (2008): a guide to the project management body of knowledge (pm Bok)
- ISO/FDIC 31000: 2009 (ISO/ IEC guide73)

Q2: You are going to initiate a construction project. During the project, annual probability of occurrence of a hazardous event is (ID/6585200). If the event occurs. Then the cost of the loss will be 45,275,000 US$ (consequence). By referring to table 2.1 and table 2.2, identify the risk level in the risk matrix shown in figure 2.1. Hint: you can take help from Lecture and book "Risk Analysis Engineering and Economics" by Bilal M. Ayyub.

Ans: Given Data:

- Annual probability of occurrence of a hazardous event = ID/6585200
- Cost of the loss, consequence = 45275000$

Required:

- Identification of the risk level in the risk Matrix

Solution:

Given that the annual probability of occurrence of a hazardous event i-e
Likelihood = ID/6585200
Putting ID = 15523 in above,
Likelihood = 15523/6585200

= 0.00235725
= 0.002357

Consequence = 45,275,000$
Since,
Risk = likelihood * Consequence
We need to categorize likelihood and the consequence
First categorizing the likelihood table 0.1 (given)

Unlikelihood = 0.002250 which is greater than 0.001 but less than, Hence, likelihood fall in category C i-e very unlikely

Now, consequence Category
Consequence = 45,275,000
From table 2.2,
10,000,000 <45,275,000 < 100,000,000

The consequence is category IV (significant loss)

Hence,

The risk level from risk matrix is low (L)