Mid term exam paper

Name: Sangar

ID: 15570

Subject: Risk and Disaster management

Instructor Name: Muhammad Yasin

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Risk introduction: Risk is the possibility of something bad happening; risk involves uncertainty about the effects/implications of an activity with respect to something that humans value, often focusing on negative, undesirable, consequences.

Risk can be hard to see in the world around us. Sometimes it might look like wobbly ladder or ice on the sidewalk. When it comes to disasters, risk is of-ten invisible on a day-to-day basis. Walking around the neighborhood, it's hard for the untrained eye to see where a flood might happen or identify what could get damaged during an earthquake.

Risk is a combination of three components: Hazard, Exposure, and vulnerability.

Hazard: a potentially destructive physical phenomenon like earth quick, a flood, a windstorm, drought and etc.

Exposure: the location attributes, and value of assets that are important to communities (people, buildings, factories, farmland and etc) and that could effect by a hazard.

Vulnerability: the likelihood that as sets will be damaged/destroyed/affected when exposed to a hazard. For example a building with multiple floors may be more vulnerable to shaking from an earthquake and more likely to collapse then on-story building, and elderly person may be more vulnerable to the impact of flooding because he/she has harder time evacuating or moving quickly.

The spectrum of risks in construction:

1. Risks associated with the feasibility stage

2. Risks associated with the design stage
3. Risks during construction associated with the site of the project and its location
4. Risks during construction associated with the technical aspects of the project
5. Risks during construction associated with Acts of Man
6. Risks associated with the post-construction stage

In light of above spectrum there were risks involve during in construction of Peshwar BRT which are indentified by ADB's technical staff as below so we will support our answer with logical and factual arguments along with reference and describe the their association with technical aspects:

The ADB has indentified below critical deviations from the detailed project designed at the implementation stages , which not only compromised its quality but could also cause injuries to passengers:

1st Deficiency: the provincial authority have used slippery floor tile, the safety signaling yellow tiles are also missed and instead of using directional tiles as was required, the provincial government has placed trapped arrows.

As using of slippery floor tiles, missing of safety signaling yellow tiles, and placing of trapped arrow tile instead directional tiles are outcome of defective workmanship and material and its include in during construction work this risk is associated with technical aspect of the project stage and in addition above deficiencies varied from contract document so we can say they are associated with Risks during

construction associated with Acts of Man too and they will make safety and serviceability problem during post construction stage.

So the deficiencies will be revised by removing of slippery floor tiles by tile of ceramic which use in floor and have frication surface, the safety yellow signaling tile which missed should be revised as per design and as contrary to requirement trapped arrow tiles is not applicable instead of directional tile and make problem in serviceability and safety too,so implementer will remove the installed trapped arrow tile and placed directional tiles as per requirements.

2nd Deficiency: the directional arrows are entirely missing from the implementation as a remedy it will not be acceptable to merely placed trapped arrow on the surface.

The above deficiency is related to inadequate site management because the technical staff do not follow up the drawings and work process properly so it's also associated with risks during construction associated with the technical aspect of the projects and in addition it related to mistaken action because the wrong work done (trapped arrows are installed instead of directional arrow) too. Because surface trapped arrow does not work as directional arrow so it should be revised by directional arrow as per design.

3rd Deficiency: in yet another glaring deviation, the curb interface between the vehicle and the platform does not meet the Kassel curb design mandated in the detailed design of the project.

The defect is related to defective workmanship and defective design of risk during construction associated with the technical aspects of the project. Because this glaring deviation, designed incorrectly revised of

the mentioned deficiency most important for a way of reducing, boarding and alighting times per passengers customer climbing even relatively minor steps can mean significant delay and an increasing in safety hazard particularly for the elderly, disabled or stroller, as we mentioned previously, the BRT standard include level boarding as one the BRT basic, the essential of BRT.

The implementer should revised the work and make them as per design of the project.

4th deficiency: the width of lane, against requirement of a at least 6.5meter is generally below the minimum threshold at many station

As per risk Risks during construction associated with the technical aspects of the project stage the mentioned deficiency is related to inadequate workmanship and site management and defective design, from my point of view the technical staff not check and follow up the site work against drawings properly to design them correctly.

The implementer must try ultimately to make width of lane as per design, if it's impossible to revise, client will deduct from contract amount and give them notice.

5th deficiency: there is significant concern of corridor lane width at turns near BS10, BS12, BS15 and BS26. Over the course of operation, the current design may well result in collisions between BRT vehicles, according to the ADB correspondence.

As per technical aspect during construction it's related to defective design.

Survey data is very important for design so from my point of view mentioned defective design have performed as defective survey so now we can check the possibilities to revised design and make them as per requirement.

6th deficiency: The station roofs are not as built as per the design and at many stations the passengers will be exposed to rain during boarding. so we can as per technical as per during construction work it related to defective workmanship and inadequate sit management and defective design because if the technical staff follow up supervision properly hence the workmanship would not be ruined and work will be performed as per design.

As the road marking is also defective so from my point of view as per technical aspect of during construction it related to defective material and workmanship because if they use correct material and installed them correctly the marking were not defect.

I found some other deficiencies from deferent reports which are related to technical aspect during construction like improper storing of rebar, delay in timely completion of work.

Material storing: As we know that material storing is important in construction work and they have own standard requirements to protect construction material from defectiveness particularly rebar because if remained them in free weather they will be corroded and decrease the quality of rebar.

So as per technical aspect of during of construction work it related to corrosion.

Rebar should be stored as below:

- Store bars of difference classes, sized, lengths, separately to facilitate issues in such sizes, and lengths so as minimize wastage in cutting from standard length.
- Paint the end of bars of each class in distinct separate colors.
- Coat steel reinforcement with cement wash before stacking to prevent scaling and rusting.
- If reinforcement bars have to be stored for a long period of, then stack it above ground level by at least 150mm.

So all construction material should be stored as their equipments to protect them from defectiveness

Delay in timely completion: the relevant repots of consultant like the feasibility study, drainage report, geotechnical report, highway report, structural report, survey and utilities report etc were found deficient resulting into frequent design changes during execution of work causing delay in timely completion of work.

So as per technical aspect during construction work it related to extended during of construction work.

Dangerous substance and items during construction and or commissioning:

It's stated that poor substance low quality material is used during construction of BRT Peshawar according to following statements:

The ADB stopped the provincial government from making future payment to contractor because of poor quality work. the ADB loan will not be disbursed further until provincial government introduce changes in the design to address critical deficiencies.

The interior quality construction could damage the projects reputation at the international level.

Mechanical and electrical breakdown inadequate site management:

Considering his position at the BRT as an assistant engineer, Gohar went on to say, "The contractor has not yet submitted any schedule for the completion of BRT project nor progress report has been submitted to any concerned department.

"The contractor of the project has [sublet] the entire project to different non-technical people who don't even know about construction."

He further claimed that the site inspector did not have any "drawings and specifications of the project" with him to help guide the engineers."The engineers were found just to visit the site without any drawing and specifications. "Reference [Peshawar BRT management dismisses corruption allegations as ‘baseless

Conclusion:

All above deficiencies are related to technical aspect of the project and will make safety, serviceability and quality risks in stage of post construction of project and beneficiaries will face to more problems.

Above problems raised from fault feasibility study, fault reports, some defected designs, in adequate workmanship, in adequate site management and supervision

Question#2:

Introduction:

Risk matrix: Risk matrices, also called heat maps, are basically tools for representing and displaying risks by defining ranges for consequence and likelihood as a two-dimensional presentation of likelihood and consequences. According to this method, risk is characterized by categorizing probabilities and consequences on the two axes of a matrix. Risk matrices have been used extensively for screening of various risks. They may be used alone or as a first step in a quantitative analysis. Regardless of the approach used, risk analysis should be a dynamic process, that is, a living process where risk assessments are reexamined and adjusted. Actions or inactions in one area might affect the risk in another; therefore, continuous updating is necessary.

In the figure, each boxed is shaded depending on a subjectively assessed risk level. Three risk levels are used here for illustration purposes: low (L), medium (M), and high (H). Other risk levels may be added using a scale of five instead of three, if necessary. These risk levels are known as severity factors. The high level can be considered unacceptable risk, the M level can be treated as either undesirable or acceptable with review, and the L level can be treated as acceptable without review.

Methodology:

Given data:

Annual probability of occurrence of a hazardous event is (ID/6585200)=15570/6585200=0.0024

Cost of loose (Consequence) = 45,275,000 US$

Solution:

For finding of risk in table of risk matrix first we indentify probability in table 2.2 and consequence in table 2.4.

Table 2.2

Likelihood categories for risk matrix

Category	Description	Annual probability Range
A	Likely	≥0.1 (1 in 10)
B	Unlikely	≥0.01 (1 in 100) but <0.1
C	Very unlikely	≥0.001 (1 in 1,000) but <0.01
D	Doubtful	≥0.0001 (1 in 10,000) but <0.001
E	Highly unlikely	≥0.00001 (1 in 100,000) but <0.0001
F	Extremely unlikely	<0.00001 (1 in 100,000)

Our probability price is 0.0024 and as per above table it's in category C and likelihood description is very unlikely.

Table 2.4

Example Consequence Categories for a Risk Matrix in Monetary Amounts (US$).

Category	Description	Cost (US$)
I	Catastrophic loss	≥10,000,000,000
II	Major loss	≥1,000,000,000 but <10,000,000,000
III	Serious loss	≥100,000,000 but <1,000,000,000
IV	Significant loss	≥10,000,000 but <100,000,000
V	Minor loss	≥1,000,000 but <10,000,000
VI	Insignificant loss	<1,000,00

The cost of loose or consequences cost is 45,275,000 US$ so it's in category IV consequence description is Significant loss.

Now we calculate the risk level as per below risk matrix table.

Risk matrix or heat table:

Probability Category	A	L	M	M	H	H	H
	B	L	L	M	M	H	H
	C	L	L	L	M	M	H
	D	L	L	L	L	M	M
	E	L	L	L	L	L	M
	F	L	L	L	L	L	L
		VI	V	IV	III	II	I
	Consequence category						

Conclusion: As per comparing of Probability category and Consequence category the risk level is Low level (L) so it can be treated as acceptable without review.