



جامعة الجميع الذكية
EVERYONE'S SMART UNIVERSITY

Everyone's Smart University

Project (Spring 2021)

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Section

Master

Date

Thursday

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Course Code

(PMG510)

Project Risk Management

CONSTRUCTION OF MUNA-4 110/13.8 KV SUBSTATION

1. Introduction:

In 2015 I was assigned as project manager for CONSTRUCTION OF MUNA-4 110/13.8 KV SUBSTATION and network connection project in holy Makkah area, in this report will focus on the risk management plan during *project planning phase*.

1.1 Project objective:

MUNA area is a fast load growing area. This area is fed power from existing Muna (MNA), Muna-2 (MNA-2), Muna-3 (MNA-3), and Moaisam (MASM) substations. To keep the loading of the existing substations within its firm capacity and to meet with the growing power requirement of this area, construction of MUNA-4 substation is necessary. Saudi Electricity Company in the Western Region (CLIENT) signed the contract in order to expand its 110kV systems in the MAKKAH area. The substation will be named as MUNA-4 substation and will be located in Makkah holy area. For further project brief, Project Charter is attached in appendix-1.

2. Literature Review

The definition of “risk” used by the authors of A Guide to the Project Management Body of Knowledge (PMBOK® Guide) is consistent with most modern risk management standards. The PMBOK® Guide describes risk as, An uncertain event or condition, that if it occurs, has a positive or negative effect on a project's objective. The key element of this definition is that the effect of the uncertainty, if it occurs, may be positive or negative on the objectives of the planned endeavour. Many things are uncertain; risks are by definition only those uncertainties that will impact the project should they occur. ^[1]

To make sure that everybody connected with a project is aware what a risk is, one common definition should be drawn up for the purpose of the particular project. To quantify identified risks, Westland (2006) uses a tool where likelihood of occurring risk is rated. This method is called Qualitative methods^[2]. Qualitative methods are related to the quantitative methods, and in some cases constitute its foundations. ^[1]

PMI identifies four qualitative methods for risk assessment: Risk probability and impact assessment, Probability/impact risk rating matrix, Risk Categorization and Risk Urgency Assessment. ^[1]

3. Methodology

First of all we will prepare risk probability and impact assessment, the likelihood of a specific risk to occur is evaluated. Furthermore, risk impact on a projects objective is assessed regarding its positive effects for opportunities, as well as negative effects which result from threats.

after that, we will perform Risk categorization, and Risk Urgency Assessment which includes risks categorization based on its severity.

Then, Risk response shall be prepared, which indicates what action should be taken towards the identified risks and threats using the 4T's (Tolerate, Transfer, Treat & terminate).

At last, Mitigation action shall be discussed in order to minimize the potential risks as possible. The figure below summarized the 4 steps mentioned above:

S.N	List of Risks	Probability	Impact	Severity	Response	Mitigation
1	Delay in delivery of main equipment's	0.3	0.7	Medium	Transfer	Supply chain shall manage and control the P.O's assuring the shortest possible delivery
2	Permit to perform site excavation using explosive materials due to site rocky area	0.7	0.8	High	Terminate	The cost impact will be significant, immediate coordination with the governmental authorities shall take place to secure the required permits. dedicated representative in coordination with PR shall be assigned, Top management support will be required.

3	Work suspension and site access restrictions during Hajj season	0.9	0.6	Medium	Treat	This is strict regulation, project schedule shall consider the minimum site activities during this period, additional resources/overtime shall be planned to recover the suspension.
4	Technical issues related to interface with existing facilities.	0.2	0.25	Low	Tolerate	Proper site visits shall be performed as well as design optimization.
5	Metal prices fluctuation	0.2	0.4	Low	Transfer	Procurement shall book the metal immediately when the prices are within the acceptable range

After preparing the risk probability and impact assessment, and in order to quantify the risks based on the cost impact, we will use the EMV technique to calculate the required contingencies shall be added to the project cost, by multiplying the probability with its cost impact.

S.N	List of Risks	Probability	Cost Impact (SR)	Risk Contingency (SR)
1	Delay in delivery of main equipment's	0.3	3,000,000	1,000,000
2	Permit to perform site excavation using explosive materials due to site rocky area	0.7	10,000,000	7,000,000
3	Work suspension and site access restrictions during Hajj season	0.9	1,500,000	1,350,000
4	Technical issues related to interface with existing facilities.	0.2	750,000	150,000
5	Metal prices fluctuation	0.2	1,000,000	200,000
Total				9,700,000

4. Results and Discussion

From the case study above, it is shown how important the risk management plan is, and the impact which could have in the project success and profitability.

On the other hand, Risk identification and management process shall be continuous throughout the project life cycle, new risk may occur going forward, other risks might need to be re-evaluated as well, some threats might become an opportunity, impacts might change.

Proper Risk management shall give the project manager huge advantage to reach the project success, meeting the project success criteria utilizing as minimum from the budgeted contingences will lead to profit increase which is the best result.

5. References:

1. The PMBOK® Guide.
2. Westland (2006).
3. Risk Management Practices in a Construction Project – a case study,
CHALMERS UNIVERSITY OF TECHNOLOGY

6. Appendices:

- 1- Project Charter.

PROJECT CHARTER

Project Name: Construction of MUNA-4 110/13.8KV Substation	Contract Number: 4400005710
Date: 8-April-2015	Revision Number: 3.0

1. PROJECT GOALS

In order to enhance and expand the 110kV network systems in the MAKKAH area, and in order to meet the fast load growing at MUNA area and the connection with western region power grid, Saudi Electricity Company decided to build new 110/13.8kV Substation. The substation will be named as MUNA-4 substation and will be located in MUNA premises within Holy Makkah.

2. SCOPE DEFINITION

The project scope of work will include new 110 kV indoor GIS type Substation, arranged in a double-bus-single breaker configuration in MUNA area.

The new Substation which shall be constructed under this PROJECT will be fed from 6 Nos. OHTL/UGC circuits (by other) , Two circuits from HUNAYN BSP, One circuit form WADI JALEEL substation, One circuit from MUNA Substation and Two circuits from Haram road substation.

The new substation shall be equipped with Substation Automation System (SAS) and will be remotely controlled/supervised from the Remote Supervising Station/CLIENT Power Control Center (PCC) through SCADA system, Gateway with redundant Communication configuration.

3. PROJECT MILESTONES

Contract Signing & Notice To Proceed	08 th April, 2015
Site Handing Over	26 th April, 2015
Technical Completion Certificate	(14 months) - 28 th June, 2016
Preliminary Acceptance Certificate	(16 months) - 28 th August, 2016
Final Acceptance Certificate	(19 months) - 28 th November, 2016

4. CONTRACT VALUE

The Contract Value is 118,600,000.00 SAUDI RIYALS ONLY.

5. CUSTOMERS/STAKEHOLDERS

The Project will have the following main stakeholders:

- 1- Saudi Electricity Company – Western Operating Area (SEC-WOA).
- 2- National Grid Western Operating Area (NG-WOA).
- 3- Holy Makkah Municipality.
- 4- Saudi Services for Electro Mechanical Work (Contractor).
- 5- Main Vendors & Subcontractors.

6. RELATED DOCUMENTS		
Reference is made to Contract documents including Project Technical Specifications & drawings-Bid clarifications, Contractor Technical & commercial proposal, Post Bid clarifications and Contractor response.		
7. PROJECT ORGANIZATIONAL STRUCTURE		
<i>Project Organization Chart is enclosed in appendix-1.</i>		
8. PROJECT RISKS		
1. <i>Permit to perform site excavation using explosion materials due to site rocky area.</i> 2. <i>Work suspension and site access restrictions during Hajj season.</i> 3. <i>Delay in delivery of main equipment's.</i> 4. <i>Technical issues related to interface with existing facilities.</i>		
9. PROJECT SUCCESS CRITERIA		
<i>The project shall be performed in line with contract documents and CLIENT standards and specifications in the agreed contract amount and meeting the contractual mile stones.</i>		
10. PROJECT AUTHORIZATION		
Approved by:	CLIENT representative	Date
Approved by:	Project Manager	Date