جامعة الجميع الذكية
EVERYONE`S SMART UNIVERSITY

Everyone's Smart University

Project (Spring 2021)

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Project Risk Management

Instructions:

- اخر موعد للتسليم هو يوم الخميس 2021-05-08 في تمام الساعة ٩ مساءً.
- الإجابة متاحة باللغة الإنجليزية أو اللغة العربية مع مراعاة أن تكون المصطلحات العلمية باللغة الانجليزية.
- يتم تسليم المشروع في صيغة ملف . pdf مع الالتزام نموذج الجامعة ولن تقبل أي مستندات أخري.
- يجب مراعاة أقسام البحث الرئيسية (مقدمة Introduction، دراسات علمية سابقة Literature Review، طريقة البحث Methodology، النتائج والمناقشة Results and Discussion ، وأخيراً المراجع References . وان كان هناك ملحقات Appendices يتم إضافتها)
- يجب الالتزام بـ Theme موحّد كما يلي:
- حجم الخط 12.
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- عدد صفحات البحث (لا يقل عن ثلاث صفحات ولا يزيد عن ست صفحات).

Instructor's Name: Eng. Mosaab M. Hamed

IDENTIFING AND ANALYISNG PROJECT RISKS FOR REPLACING OLD DISTRIBUTION TRANSFORMERS IN DALLAH HOSPITAL ORGANIZATION

1. INTRODUCTION

Distribution transformers considered as the main components that providing power for utilities. Replacing old transformers for existing hospital that contains operation rooms, coronary care units and catheterization procedures which operate at full capacity will not be an easy job. The demand loads from old transformers must be calculated precisely in order to supply power from alternative power supply without fail. The new transformers loss of life also must be taken into consideration and determined by measuring and estimating the daily load profiles [1]. Planning for this kind of risky job must be by using a project management tool such as a risk matrix (probability/impact), which is one of most commonly used qualitative assessment method that considered as a key to effective planning [2]. Dumbrava, V. & Iacob, V. (2013) reveal that it is possible to avoid the hazardous events if the projects are carefully analyzed and accurately assessed. Usually mangers prefer the qualitative assessment methods which can be easily explained to third parties [3]. In this paper, probability-impact matrix will be implemented for replacing old transformer project in order to have an effective planning which effect on the project success.

2. LITERATURE REVIEW

Murray S., Grantham k. & Damle D. (2011) studied a “Development of a generic risk matrix to manage project risks”. The purpose of their study is to fast identifying and assessing project risks, minimizing cost and schedule overruns by using a generic risk matrix [5]. The generic risk matrix (GRM) is a set of risks that are ranked and classified according to their potential impact and probability of happening [5]. The study focus on identified nine categorize and associated risks such as technical & operational risk, financial & economic risk, procurement & contractual risk, political risk, environmental

risk, social risk, regulatory & legal risk, safety risk and delay risk. As a result of Murray S., Grantham k. & Damle D. (2011) survey, 23% of project managers do not frequently use the risk management. The advantage of the mentioned matrix (GRM) is that easy to use and can help project managers to perform project risk analysis especially when they have few resources [5]. Another research paper was written by Bastian, A., Tryollinna, A., & Prabaswara, C. P. (2017) discussed “health and risk assessment of power transformer in PLN Transmisi Jawa Bagian Barat” (TJBB). The model of determining risk of transformer failure was developed by PLN TJBB [4]. Health & risk assessment of power transformer were combined in the mentioned model [4]. As defined in the research, “Health assessment model describing condition of each subsystem of power transformer, while risk assessment considering some external parameters that can affect transformer performance” [4]. From external parameters, there are four risk factors that determined based on the environmental condition (from operated transformer) such as average load, reliability, age and typical load of transformer [4]. After combining both health and risk assessment model into a matrix, the result shows that the transformer with high probability of failure could be replaced [4].

3. METHODOLOGY

This paper derived information from related sources such as journals, books, published conference papers and theses that has relationship with the objectives of the study. Reference to above mentioned that replacing old transformers project is based on the usage of the probability-impact matrix. It is shown in below table#1, the probability and impact classification. Tables# 2 & 3 show the likelihood score risk and impact & exposure analysis respectively.

Table#1: Probability and impact classification [3].

Probability Classification	Score	Impact Classification	Score
Low	1	Major	3
Medium	2	Medium	2
High	3	Easy	1

Table#2: Likelihood score risk [3].

Likelihood level	Score
Very low	0-20
Low	21-40
Medium	41-60
High	61-80
Very high	81-100

Table#3: Impact & exposure analysis [3].

Magnitude of impact	Impact definition	Score	Rating	Exposure score
High impact/ High probability	**Very high** They are the biggest risks that entrepreneurs should pay attention.	5	A	90
High impact / Medium probability Medium impact / High probability	**High** These risks have either a high probability of occurrence, or a significant impact	4	B	80
Medium impact / Medium probability	**Medium** There is a medium chance that the risks appear noticeable impact.	3	C	50
Medium impact / Low probability Low impact / Medium probability	**Low** These risks can occur in some situations and have a low to medium impact.	2	D	40
Low impact / Low probability	**Insignificant** There are risks with low probability of occurrence and low impact. Can therefore be neglected.	1	E	15

Tables# 4 & 5 illustrate the probability, impact & exposure and EMV calculations respectively.

Table#4: Probability, impact & exposure calculations.

#	Risk	Occurrence Likelihood		Impact		Degree of risk exposure	
		Probability	**Score**	**Probability**	**Score**	**Rating**	**Score**
1.	Other transformers are overloaded	High	65	High	4	B	80
2.	Power failure	Low	40	Very high	5	A	90
3.	New transformer not working	Very low	10	Very high	5	A	90
4.	Cable get short-circuit during testing	Medium	45	High	4	B	80
5.	Breaker cannot be ON	Very low	20	Medium	3	C	50
Total							390

Table#5: EVM calculation.

Risk	Risk Probability (P)	Cost Impact (IC)	Risk Contingency (P*IC)
1.	0.65	10,000 $	6,500 $
2.	0.40	50,000 $	20,000 $
3.	0.10	30,000 $	3,000 $
4.	0.45	4,000 $	1,800 $
5.	0.20	1,500 $	300 $
Total		95,500 $	31,600 $

4. RESULTS AND DISCUSSION

As shown above, the probability-impact matrix and EVM calculations are implemented for replacing old transformer project in order to have an effective planning which effect on the project success. Table#4 illustrates the risk type, probability & impact. Overloaded transformers, power failure, defective of new transformers, cable short-circuit & dead circuit breaker risks can be mitigated by calculating the total connected loads precisely, alternative power supply should be taken into consideration, ensuring the emergency generators are ready to take loads for a days, provide redundancy cables and circuit breaker respectively.

Table#5 shows the total impact cost is 95,500 $, while the total risk contingency cost is 31,600 $.

5. REFERENCES

[1] J. A. Jardini, H. P. Schmidt, C. M. V. Tahan, C. C. B. De Oliveira and S. U. Ahn, "Distribution transformer loss of life evaluation: a novel approach based on daily load profiles," in *IEEE Transactions on Power Delivery*, vol. 15, no. 1, pp. 361-366, Jan. 2000, doi: 10.1109/61.847274.

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[3] Dumbravă, V., & Iacob, V. S. (2013). Using probability–impact matrix in analysis and risk assessment projects. Descrierea CIP/Description of CIP–Biblioteca Națională a României Conferința Internațională Educație și Creativitate pentru o Societate Bazată pe Cunoaștere–ŞTIINŢE ECONOMICE, 42.

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[5] Murray, S. L., Grantham, K., & Damle, S. B. (2011). Development of a generic risk matrix to manage project risks. Journal of Industrial and Systems Engineering, 5(1), 35-51.