

THE DEVELOPMENT OF SOFTWARE FOR SELECTING LOW
VOLTAGE CABLE IN MAIN SWITCHBOARD (MSB)



AZWAN BIN OTHMAN
2002240780
B.ENG (Hons) ELECTRICAL
Faculty of Electrical Engineering
UNIVERSITI TEKNOLOGI MARA (UiTM)
Shah Alam, Selangor Darul Ehsan

ACKNOWLEDGEMENT

BISMILLAHIRAHMANIRAHIM. In the name of ALLAH S.W.T, the Most Gracious, the Ever Merciful. Praise to ALLAH S.W.T, Lord of the Universe and Peace and Prayers be upon His final Prophet Muhammad s.a.w and Messenger.

First of all, I would like to take this opportunity to sincerely express my highest appreciation to my project supervisor, Ir Harizan Hj Che Mat Haris for his guidance, suggestions, advices and constructive ideas in helping me throughout the course in this project.

I would like to extend my thanks and grateful to all those who have helped make this journey worthwhile. I express my deepest thanks and appreciation to: My family for their moral support and encouragement to deliver the best work that I could. All my friends, together with whom I have shared my highs and lows, for all the opinions and suggestions. All those who have contributed information, knowledge, ideas, time and effort directly or indirectly in this progression of this project.

Honestly, no words could make up for the things that they all have done for me. I am grateful for all the favors and support. Thanks you and may ALLAH S.W.T bless them.

TABLE OF CONTENTS

CHAPTER		PAGE
1	BACKGROUND OF THESIS	
	1.1 Aim and Objective	1
	1.2 Project Scope	2
	1.3 Project Planning	3
2	POWER SEPARATION SYSTEM	
	2.1 Introduction	4
	2.2 Procedure for Electricity Supply	5
	2.3 Needed an Efficient in Planning System	5
	2.4 Planning in Action	6
3	FAULT ANALYSIS IN POWER SYSTEM	
	3.1 Introduction	7
	3.2 Fault Classification	8
	3.3 High Voltage Underground Cable Fault Location	9
	3.4 Preliminary Test and Fault Diagnosis	10
	3.4.1 Continuity Test	11
	3.4.2 Insulation Resistance Test	11
4	PLANNING THE SEPARATION SYSTEM	
	4.1 Introduction	13
	4.2 Planning System Explanation	13
	4.3 Planning System Requirement	14
	4.4 Planning In Action	15
	4.5 Line System Planning	15
	4.6 Ring System	15

TABLE OF CONTENTS

CHAPTER		PAGE
5	CABLE PLANNER	
5.1	Introduction	17
5.2	Cable Insulation Material	17
5.2.1	Rubber	17
5.2.2	Paper	18
5.2.3	PVC	18
5.2.4	LSF (Low Smoke and Fume)	19
5.2.5	Thermosetting (XLPE)	19
5.2.6	Mineral	19
5.3	Characteristic of Cable Material	21
5.4	Consider the Cable Size	24
5.4.1	Definition	24
5.4.2	Voltage Drop	25
5.4.3	Factors That Cause Voltage Drop	25
5.4.4	Example of the Calculation to Determine Cable Size	26
5.4.5	Determination of the Cable Size	26
6	SOFTWARE DESIGN USING VISUAL BASIC 6.0	
6.1	Introducing Visual Basic	29
6.2	Events and Event Procedures	29
6.3	Object Related Concept	30
6.4	The Visual Basic Program Development Process	31
6.5	Required Computer Skills	32
6.6	Logical Program Organization	33
6.7	Visual Basic Program Component	33
6.8	The Visual Basic Environment	34
6.8.1	Title Bar	35
6.8.2	Menu Bar	35

CHAPTER 1

BACKGROUND OF THESIS

1.1 Aims and Objective

The aim of this project is to develop a computerised work management system for electrical power distributions process. The Development of Software for Selecting Low Voltage Cable in Main Switchboard is software to help user in making decision to choose type of cable and circuit breaker that suitable for the connection from the main switchboard to the load in low voltage system.

For many years, the design of electrical installation in buildings has been done manually. The work involved is rather tedious, time consuming and repetitive in nature. The designer may not have the time and resources to make a complete check on every item of the installation designed by them. With this software, it is hope that the planning and calculation can be done in a more efficient and effective manner. Building structure and the large large volume of design elements such as various type of cable and their installation methodes and various type of circuit breaker, can now be streamlined into a record structure.

This software has been developed by using Visual Basic 6.0 programming language. The measurement of the cable will be calculated internally by this software. This software will calculate the full load current (I_b), trip rating of circuit breaker (I_n), size of cross sectional area of cable and then give the best decision of what type of cable and circuit breaker that can be used in the system. After the calculation, user can see the result in the summary table in the software. The best selection of cable size is important to make sure there is no problem when the system is constructed and to cut off the cost implications for the cable. For example, if the cable size is too small, there may have cable problem or fault but if the cable is too big, the cost of the cable will increase.