

**STUDY ON SYSTEM UPGRADING FOR SUPERVISORY CONTROL AND  
DATA ACQUISITION (SCADA) AT RASA WATER TREATMENT PLANT  
(RWTP)**

Thesis is presented in partial fulfillment for the award of the  
**Bachelor of Engineering (Honors) Electrical**  
**UNIVERSITI TEKNOLOGI MARA**

**DEC 2009**



**SUHAILA BINTI MUSA**  
**FACULTY OF ELECTRICAL ENGINEERING**  
**UNIVERSITI TEKNOLOGI MARA**  
**40450 SHAH ALAM**  
**SELANGOR, MALAYSIA**

## ACKNOWLEDGEMENTS

In this limited page, I would like to thank to Almighty because successful finish this final year project. In the name of ALLAH, the Most Grateful, who has gives me strengths and patient to complete this project successfully. Even with all our great technology, our standing of the world is so limited. As a student, His infinite wisdom and design humble me. Without Him, we are nothing.

A thousand thanks to my project supervisor, Madam Norhazlin Khairudin for her helps, advices, guidance also support to me along this project duration. Also thanks to my co-supervisor, Mr. Syed Abdul Mutalib Al Junid that likes to share and give a thousand ideas that useful to conduct me to finish this project. Then, thanks to Mr. Adib and Mr. Huzaimy. With their supports and advices, this project had achieved the objectives and target. Next, to my parents and family that their supports.

I would like to express my appreciation to my mentor, Mr. Rahim Jamros as a Head of Electrical and Instrumentation Department for his support and guidance throughout the making this project. With his supervision, this project had accomplished its prescribed objectives. Thanks also to all staff of Syarikat Pengeluar Air Sungai Selangor Sdn. Bhd. (SPLASH) especially to Madam Sharifah Alauyah Wan Othman as a General Manager and Mr. Wakil Hasbi as a Plant Manager Rasa Water Treatment Plant (RWTP).

Next, I would like to express my gratitude towards Abdul Zaffa Zamani, Zawifatulaziah, Ahmad Ilmi Farid, Siti Farisha, Nurul I'zzati and all my friends that like to share and give a thousand ideas that useful to complete this project.

Finally, I would like to thanks to all people who involve in this project even direct or indirect.

## **ABSTRACT**

The implementation of new version monitoring and control system in water treatment plant can increase the quality of supervision, production and monitor quality of water accurately without involve a large number of man power. This study is based on solving the real industrial problem by studying the effect of new Supervisory Control and Data Acquisition (SCADA) system implementation on Rasa Water Treatment Plant (RWTP) for increased production clear water with minimum man power, high accuracy and efficiency. The objectives are to study, evaluates and propose the new suitable of SCADA system for implementation in RWTP. The result is based on analysis of existing RWTP data using the existing SCADA system and expected result based on latest version of SCADA system implementation proposed on RWTP.

The efficiency and potential of new proposed SCADA system has been compared and analyze based expected production projection and financial projection. Preventive maintenance has been highlighted in future recommendation as a precaution to maintain and optimize the new version of SCADA system for increase the RWTP production and optimize the financial projection.

# TABLE OF CONTENTS

<b>DECLARATION .....</b>	<b>i</b>
<b>DEDICATE .....</b>	<b>ii</b>
<b>ACKNOWLEDGEMENT .....</b>	<b>iii</b>
<b>ABSTRACT .....</b>	<b>iv</b>
<b>TABLE OF CONTENTS .....</b>	<b>v</b>
<b>LIST OF FIGURES .....</b>	<b>ix</b>
<b>LIST OF TABLES .....</b>	<b>xi</b>
<b>LIST OF ABBREVIATION .....</b>	<b>xii</b>
<b>CHAPTER 1            INTRODUCTION .....</b>	<b>1</b>
1.1    BACKGROUND OF PROJECT .....	1
1.1.1    SSP3 Components .....	2
1.1.2    SSP3 Water Treatment Plants .....	3
1.2    PROBLEM STATEMENT .....	4
1.3    SCOPE OF PROJECT/LIMITATIONS .....	4
1.4    THESIS ORGANIZATION .....	5
<b>CHAPTER 2            LITERATURE REVIEW .....</b>	<b>6</b>
2.1    TREATMENT PROCESS .....	6
2.2    SYSTEM OVERVIEW .....	10
2.3    MASTER STATION .....	12
2.3.1    Main Mimic Panel .....	13
2.3.2    The GE Fanuc CIMPLICITY SCADA System .....	14
2.4    OUTSTATIONS .....	15
2.4.1    O/S 1: Intake Works .....	15
2.4.2    O/S 2: Clarifiers .....	15
2.4.3    O/S 3: Filtration Plant .....	16
2.4.4    O/S 4: Chlorine Building .....	16

# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 BACKGROUND OF PROJECT**

In 1998, water crisis which affected people in Selangor and the Federal Territory. Because of the crisis, one of initiated project by Selangor State Government is established. The project is Sungai Selangor Water Supply Scheme Phase 3 (SSP3).

Water demand in the State of Selangor and Federal Territory is continually increasing as a result of population growth, immigration from other states and increasing industrial, business and commercial activities.

The water crisis in 1998 spurred for an urgent detailed technical and feasibility study on the water situation in the state of Selangor. From the study, the demand for water would once again exceed supply by 2003.

The major findings of the study were the current supply situation is critical as existing treatment plants are operating at full capacity. Although SSP2 will provide an additional 475 millions of water per day (MLD) by 2000, this increased supply will be matched by demand by 2003. At Klang Valley and Northern Selangor will be the major areas of demand growth. The State has one remaining source of water supply which is Sungai Selangor from which an additional 1,050 MLD may be obtained. The other reason is the cost of water from Sungai Selangor is cheaper than other possible sources.

The study revealed a need to urgently implement a new water supply scheme. This scheme, the Sungai Selangor Water Supply Phase 3 (SSP3) will meet the future needs of 2 million residents and new industries in the state of Selangor and the Federal Territory.