# FACULTY OF ELECTRICAL ENGINEERING UNIVERSITI TEKNOLOGI MARA

MALAYSIA



# PERFORMANCE EVALUATION FOR SE113 FLOW CONTROL SYSTEM PLANT USING SELF-TUNING FUZZY PI CONTROLLER

This thesis is presented in partial fulfilment for the award of the Bachelor of Engineering (Hons) Electronic Engineering FACULTY OF ELECTRICAL ENGINEERING UNIVERSITI TEKNOLOGI MARA MALAYSIA



AHMAD SHAHIR BIN MUSTAFFA 2013821766 FACULTY OF ELECTRICAL ENGINEERING UNIVERSITI TEKNOLOGI MARA 40450 SHAH ALAM, SELANGOR DARUL EHSAN

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### ABSTRACT

The aim of this project is to evaluate the process performance of SE113 Flow Control System Plant using self-tuning Fuzzy PI controller. The experimental data is used to model the process and the control analysis is done using Matlab Simulink. The performance evaluation is based on the percent overshoot, rise time and settling time of the process. The overall performance is compared with the conventional Proportional-Integral control method. The results had shown that self-tuning Fuzzy PI controller simplify the tediousness in tuning the controller and enhance the capability of PI controller-only.

# **TABLE OF CONTENTS**

## Contents

# Pages

| APPROVAL              | i   |
|-----------------------|-----|
| DECLARATION           | ii  |
| ACKNOWLEDGEMENT       | iii |
| ABSTRACT              | iv  |
| TABLE OF CONTENTS     | v   |
| LIST OF FIGURES       | vii |
| LIST OF TABLE         | ix  |
| LIST OF ABBREVIATIONS | X   |
|                       |     |

| CHAP | TER 1 : INTRODUCTION             |
|------|----------------------------------|
| 1.1  | INTRODUCTION1                    |
| 1.2  | BACKGROUND OF STUDY1             |
| 1.3  | PROBLEM STATEMENT                |
| 1.4  | OBJECTIVE                        |
| 1.5  | SIGNIFICANCE OF STUDY            |
| 1.6  | SCOPE OF WORK                    |
| 1.7  | THESIS ORGANIZATION              |
| CHAP | <b>TER 2 : LITERATURE REVIEW</b> |
| 2.1  | INTRODUCTION7                    |
| 2.2  | CASE STUDY7                      |
| 2.3  | FUZZY LOGIC CONTROL              |
| 2.3  | 5.1 FUZZY LOGIC FUNDAMENTAL      |
| 2.3  | B.2 FUZZY SETS                   |
| 2.3  | 5.3 FUZZY MEMBERSHIP FUNCTION11  |
| 2.3  | 5.4 FUZZY CONTROL RULES          |
| CHAP | TER 3 : METHODOLOGY              |

### **CHAPTER 1**

### **INTRODUCTION**

### **1.1 INTRODUCTION**

This chapter will discuss on the background study of the project, problem statement of current research project, the objective to be achieved, the significance of the study, scope of study and summarize for the whole chapters.

### **1.2 BACKGROUND OF STUDY**

Process control refers to the actions of ensuring a process is stable and constantly operating at a desired level by controlling the flow of energy from the source to the output device. One of the important parts in a process control is the controller, it plays a big role in term of producing and maintaining the desired output. One of the conventional controllers used in the process industries is PI controller. It is widely used because of its simplicity and can be used in an extensive range of operation [1]. PI uses the combination of P and I combination to produce the best output.

Another type process control is a Fuzzy logic control. Fuzzy logic control developed based on the basis of the Zadeh's Fuzzy set theory.it is a methodology of intelligent control that replicate human knowledge and action, but using the process of Fuzzy logic and the other elements of AI (artificial intelligence) [2]. In daily life, a lot of situational where it is characterized by a certain degree of in which the word includes term and expression such as a