PID CONTROL FOR WATER LEVEL WITH UNREGULATED DISCHARGE FLOW

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	MOHD IDZHAR AFIFI BIN ISMADI **2012241302** **Faculty of Electrical Engineering** **UNIVERSITI TEKNOLOGI MARA** **40450 SHAH ALAM, SELANGOR DARUL EHSAN**

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ABSTRACT

This paper is to identify the best control parameters and structure for controlling water level of the trainer system that located at the DCS laboratory UiTM Shah Alam. In this work, the parameter of the controller is adjusted using Ziegler-Nichols tuning method. The best control structure is analyzed by considering the rise time, settling time, overshoot and steady state error. The result showed that the water level integrating process can best control using PID with parallel structure.

TABLE OF CONTENT

CHAPTER 1

INTRODUCTION

1.1   BACKGROUND STUDY

Unregulated Discharge Flow can be define as self-regulating process. This is an unstable process which the principle characteristic is it naturally seeks a steady-state operating level for a period of time at constant controller parameters

To measure the process response, a reaction curve graph of the process been measured. This is obtained from an experiment conducted based on the unstable process. In this project, first order model is used. A first order process has an exponential response to a process step change and can be completely characterized by three parameters: dead time, time constant and gain. The first order model can be represented with:

$$G(s) = \frac{Ke^{-Tdds}}{Tc+1}$$

To control the process, a controller will be used. There are many controller exist but for this process, PID controller is used. It been used because PID controller is the most commonly used in a process. PID controller used due to the possibility of making the