# EXPERIMENTAL STUDY ON THE CHARACTERISTICS OF CASCADE CONTROL

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## DECLARATION

"I hereby declare that this report is the result of my own work except for quotations and summaries which have been duly acknowledged."

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## ABSTRACT

In many manufacturing and chemical process industries, process control has been playing a major role as to assist human resources since the last century. Ever since machines had been created to mass-produce products for customers, PID controllers have evolved from pneumatic mechanical to digital electronic devices. As the evolution occurs, PID controllers have been developed and played an inevitable role in order to ensure stability and efficiency during the production. In a parallel manner, cascade control; an advanced control strategy, has been developed to fulfill industrial needs for the processes to perform better. In this experiment, characteristics of cascade control are to be examined in Water Level Flow Training System (WLF922) plant. Two controllers of flow process, also known as and LIC31 and FIC31 are manipulated to observe the behaviour of cascade control. Others such as Reformulated Tangent Method and Numerical Technique are practical to analyze open loop test by determining dead time ($T_d$), time constant ($T_c$) and response rate (RR) as well. These parameters will be used in the next stage, in which cascade control modes involved in examining the behaviour of process variable (PV) towards setpoint. Furthermore, in order to analyze cascade control processes are categorized into three groups which are fast, medium and slow and PB,% and I,t are manipulated to achieve the results. Finally, the combination of fast, medium and slow processes are then analyzed in terms of settling time, steepness of the response curves and occurrences of significant oscillations at different PB,% and I,t.