Cawangan Terengganu
Kampus Bukit Besi

TITLE:
PID TUNING METHOD OF PROCESS CONTROL

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AUTHOR'S DECLARATION

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

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ABSTRACT

PID tuning performance using the Cohen Coon and Chien Hrones Reswick methods has been studied in liquid flow process control. The study begins with an open-loop test in order to determine some of the essential system parameters, namely dead time and time constant, from which P, PI, and PID tuning values for both methods are calculated. Stability, overshoot, settling time, and disturbance rejection will be the criteria to analyze the system response and find the most effective approach to tune it.

Results with the CHR tuning provide a higher proportional gain, which makes it faster, and more suitable for applications needing fast setpoint tracking. The disadvantages are also that it results in larger overshoots and oscillations, which do affect the stability of the system. Contrastingly, Cohen-Coon Tuning: It is much stable, with lower values of overshoot since longer times for derivative and integral dampen the response and reduce disturbances. While CC tuning is slower to respond, it offers better long-term control with fewer fluctuations.

This study concludes that CHR tuning is ideal for fast corrections, while Cohen-Coon tuning is better in maintaining system stability. The choice of a tuning method depends on the specific process requirements, balancing speed and stability. Future recommendations include exploring hybrid tuning methods, adaptive control strategies, and machine learning-based optimization to enhance PID controller performance in industrial liquid flow systems.

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