Design of PID Control Strategies of Cylindrical and Conical Tanks

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Abstract: *This project focuses on the development and implementation of high-performance PID control strategies for cylindrical and conical tank systems. The main goal is to regulate the liquid level within a set range using a controller based on a First Order Plus Dead Time (FOPDT) model. The control strategies are evaluated using key time-domain parameters such as rise time, peak time, settling time, steady-state error, and overshoot. Various PID tuning techniques—including Ziegler-Nichols, Chien-Hrones-Reswick (CHR), and Cohen-Coon—are applied and compared. The study also highlights limitations of traditional PID tuning methods like Ziegler-Nichols, especially in achieving optimal performance in nonlinear systems..*

Keywords: PID control, FOPDT model, level control, Ziegler-Nichols, CHR, Cohen-Coon, time-domain analysis.