Applying ANFIS Inverse Control Approach for Level Control Reactor in a Urea Fertilizer Plant

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Abstract— The Reactor Unit in the Urea fertilizer plant is one of the units that functions to react to the components forming the Urea fertilizer, so that this unit is one of the most important systems. During the operation of this unit, the fluid height of the liquid inside the reactor will be kept stable so that the reaction in the reactor can react perfectly according to the product specifications. Therefore we need a model that can describe the behavior of the reactor so that the level of the liquid in the reactor can be maintained. In this research, a model for reactor units will be developed at the Urea plant using the Adaptive Neuro Fuzzy Inference System (ANFIS) method using real-time operational data collected. This level control of reactor is maintained steady by level controller designed using inverse dynamics based on ANFIS. Results of simulation study demonstrate how the designed control technique performs well in tracking set-point. Performance comparison is also made between the designed and PI controllers

Keywords—ANFIS, Reactor, Model, Inverse Control, Urea Fertilizer Plant