CONTROL OUTLET CRUDE OIL TEMPERATURE OF FURNACE WITH UTILIZING HEAT OF FLUE GAS IN THE CRUDE DISTILLATION UNIT (CDU) WITH PID CONTROLLERS

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Abstract

Furnace is a tool that serves as a heater in crude oil processing, especially in the crude distillation unit (CDU). Before separated in crude oil distillation column used in a furnace heated to the temperature ± 337 °C, because at 370 °C (385 °C mention UOP) will be crude thermal cracking / thermal decomposition. Heat source obtained from the combustion of fuel gas and air. Heat from combustion used to heating crude oil and other lost through the furnace wall and the chimney (stack). Since working at high temperatures, it is necessary to maintain control of the process to take place safely and remain in the desired condition. As for efficiency furnaces utilized the flue gas heat produced to heat the air before entering the furnace.

Used in this study and performed the PID controller tuning the ratio between the Ziegler-Nichols and Tyreus Luyben, then the best tuning results will be used to control the temperature of crude oil out and controls the air temperature before entering the furnace. In furnaces with Preheater systems using PID controllers, IAE when controlling crude oil out with disturbance 2% purity of CH₄ is 97,428, 5% purity is 265,715, and 10% purity is 659.03.

Keywords: CDU furnace, PID controllers, Zigler-Nichols tuning, IAE