

## ABSTRAK

*Boiler* merupakan bagian dari unit *utilities* yang berfungsi memproduksi / menyediakan uap bertekanan tinggi ( $43 \text{ kg/cm}^2$ ) untuk keperluan operasi pembangkit tenaga listrik dan proses produksi Kilang BBM RU VI Balongan. Proses pengendalian *level steam drum* bertujuan menjaga agar *level drum* tetap pada *setpoint*, agar tidak terjadi *overheated* pada *boiler tubes* sehingga *tubes* bisa menjadi rusak dan menjaga kualitas *steam*. Rangkaian *cascade control* digunakan untuk mempercepat respon proses dan mengatasi fluktuasi pada *flow feedwater*, yang terjadi diakibatkan penggunaan beberapa pompa pada feedwater line (52-P-101 A/B/C/D). Pada rangkaian *cascade control*, 52-LC-201A merupakan *primary controller* dan 52-FC-211A merupakan *secondary controller*. Berdasarkan analisa tuning parameter PI yang telah dilakukan, tuning dengan metode (pada 52-LC-201A  $K_p = 4.2$ ,  $T_i = 0.1617$  dan  $K_d = 0.0835$ , pada 52-FC-211A  $K_p = 1.2$ ,  $T_i = 0.4$  dan  $K_d = 0.0690$ ) memiliki respon yang lebih baik dibandingkan dengan metode tuning Ziegler & Nichols, Chein Servo1 dan kondisi proses yang telah berlangsung.

Kata Kunci : Tuning, Matlab dan Algoritma Firefly

## ABSTRACT

System flood detector consist of several equipment including *Water level censor*, *sim card 800 L* and *flowmeter censor*. One alternative is to anticipate

these problems is to make a detector of water need to be supervised water level to prevent disasters that aren't in want. In the design of flood detector device via *SMS (Short Message Service)* using Microcontroller ARM STM32F4 and also water sensor that used to detect height of water.

Based on testing and observation tools, using table of indicators of success have shown the results of the experiment flowmeter, each pulse is about 2.25 milliliters. But the pace of the pulse will be influenced by the water flow, water pressure and orientation sensor. The output pulse signal is a square wave and has an average value of the errors amounted to 19,6 % as well as testing water level control, arms to look at the water level and sms. In testing water level control can function according to normal conditions more than 0 cm, high water more than 100 cm and high water more than 300 cm. Can activate buzzer and send to sms.

**Keyword : Sensor water level control, sensor flowmeter, flood detector**