

Automated power control system for reactor TRIGA PUSPATI

ABSTRACT

Reactor TRIGA PUSPATI (RTP) Mark II type undergoes safe operation for more than 30 years and the only research reactor exists in Malaysia. The main safety feature of Instrumentation and Control (I&C) system design is such that any failure in the electronic, or its associated components, does not lead to an uncontrolled rate of reactivity. The existed controller using feedback approach to control the reactor power. This paper introduces proposed controllers such as Model Reference Adaptive Control (MRAC) and Proportional Integral Derivatives (PID) controller for the RTP simulation. In RTP, the most important considered parameter is the reactor power and act as nervous system. To design a controller for complex plant like RTP is quite difficult due to high cost and safety factors cause by the failure of the controller. Furthermore, to overcome these problems, a simulator can be used to replace functions the hardware and test could then be simulated using this simulator. In order to find the best controller, several controllers were proposed and the result will be analysed for study the performances of the controller. The output result will be used to find out the best RTP power controller using MATLAB/Simulink and gives result as close as the real RTP performances. Currently, the structures of RTP was design using MATLAB/Simulink tool that consist of fission chamber, controller, control rod position, height-to-worth of control rods and a RTP model. The controller will control the control rod position to make sure that the reactivity still under the limitation parameter. The results given from each controller will be analysed and validated through experiment data collected from RTP.

Keyword: Reactor TRIGA PUSPATI; Automated power control system; Controller; Reactor