

The power level control of a pressurised water reactor nuclear power plant

*Jothi Letchumy Mahendra Kumar, Anwar P. P. Abdul Majeed, Muhammad Azzat Zakaria,
Mohd Azraai Mohd Razman, Mohd Ismail Khairuddin*

Innovative Manufacturing, Mechatronics and Sports Laboratory, Universiti Malaysia Pahang,
Pekan, Malaysia

ABSTRACT

The control system of a reactor core in a Nuclear Power Plant (NPP) is non-trivial to ensure safe operation of a nuclear power plant. Owing to the complex and non-linear characteristics of a nuclear power plant, it is, therefore, essential to control the power in load following condition through the regulation of the reactor core. The aim of this paper is to evaluate the efficacy of different variation of classical control schemes, namely, P, PI, PD and PID to control the power level output. The reactor core model is based on the H.B. Robinson Pressurised Water Reactor NPP. The control schemes evaluated were tuned based on the Ziegler-Nichols tuning method. It was demonstrated through the following simulation investigation that the PID control scheme is appropriate in regulating the power level.

KEYWORDS

Pressurised power reactor; Reactor core; PID controller

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