DESIGN OF PREDICTIVE CONTROLLER BASED ON ADAPTIVE LAGUERRE STATE SPACE MODEL FOR REDUCTION KILN 3 TC2 ONBOARD TEMPERATURE CONTROL AT PT INCO SOROWAKO

Name of student : Yulianto
Number of registration : 2406 100 022
Department : Engineering Physics FTI-ITS
Supervisor : Katherin Indriawati, ST, MT

Abstract

TC2 onboard temperature of Reduction Kiln 3 at PT INCO Sorowako still controled manually so that the system performance is not maximal. In this research, automatic control system is designed namely predictive control based on adaptive Laguerre state space model as the information for Brainwave® implementation at PT INCO Sorowako. The first step taken is to model the process that occurs in the Reduction Kiln 3 using the energy balance equation, the second is to identify the system using Laguerre series to obtain plant parameter, Laguerre coefficients. The third is to design controller. The simulation results show that from the set point test, maximum overshoot is obtained for 2,38% and settling time is obtained for 92 seconds. The load test showe that when the load increased by 94 Nm$^3$/min, onboard temperature would decrease by 5°C and increases air flow for 3 Nm$^3$/min. From the noise test temperature stability obtained at set point values but fluctuate with a variance of 38.5%.

Keywords: automatic control, predictive controller, adaptive modeling, laguerre series, onboard temperature.
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