

ABSTRACT**CONCURRENT PROCESSING DESIGN METHODOLOGY
FOR AN ADAPTIVE CONTROL SYSTEM
FOR A CEMENT ROTARY KILN****Satish Yadav**

In adaptive control and other modern control systems, the methods used are analytically sophisticated and require extensive calculations. The time of computation, being a major factor affecting the controller performance, can be minimized by breaking the sequential algorithm into a number of independent, but inter-related parts, and executing the parts concurrently.

The work for this thesis involved the simulation of control algorithms using concurrent processing techniques and thus investigating the suitability of the method. The concurrent processes representing the parts of the control system have been simulated on a single processor of the VAX-11 system, utilizing shared variables and semaphores for interprocess communication and synchronization. The proposed future work of implementing the same system design in a transputer-

-based multiprocessor environment is also discussed.

The derivation of a process model from basic physical and chemical equations has been described by taking the cement rotary kiln material-flow process as an example; the model derived was validated by flow measurements on the kiln at Trinidad Cement Limited.

The investigation concludes that the simulation of any control system, which involves considerable computation, by using concurrent processing, improves the performance of the controller by minimizing the time of execution of the complete algorithm.