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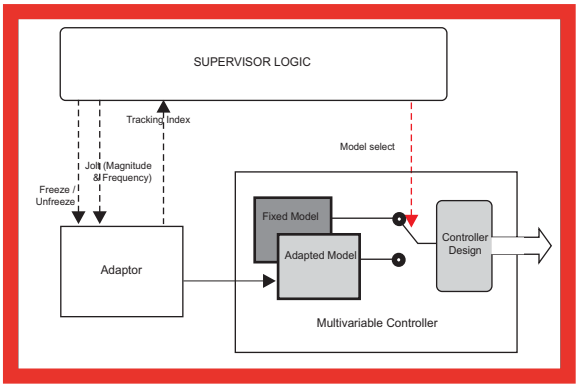
CASE STUDY: OPTIMAL DRYING

By designing and implementing an adaptive control system to an industrial drying operation, the process efficiency was improved significantly leading to substantial cost reductions and production increases.

A wide variety of products such as foodstuffs, soaps, dairy products and animal feeds undergo drying processes. These units are typically energy intensive and can account for a significant proportion of a site's total energy cost. If the material being dried is a final product then the unit is often required to operate to a tight product specification. Accurate control of dryers is therefore critical to controlling costs and optimising productivity.

Dryers may be designed to handle asynchronous batch feeds, variable feed and product specifications and wide variations in feed material constituency. A controller based on a single fixed process model may not be able to meet the challenges of all these variations. Also, conventional exhaust temperature control schemes rely on holding the outlet temperature constant by manipulating the heat input in response to load changes. Significant time lag in these systems often leads to a poor response to changes in dryer load.



By designing a predictive algorithm using Connoisseur software, Patrick Thorpe and colleagues created a more flexible and accurate control system. The model was divided into two parts; one to provide optimal operation that was updated automatically in line with variations in the process response, and a fixed process model which kicks in during dryer start-up or during the transition from drying one product to another. A supervision mechanism switches intelligently between the two models by assessing the performance of the adaptive model, so that the dryer is always operating most efficiently.

The new system provided considerable benefits to the end-customer, reducing energy costs and maximising product throughput. More details of the project can be found in *Thorpe P, Lovett D and Sandoz D, Advances in Process Conrol 5, Swansea UK (1998)*.

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