

기계고장과 작업준비를 고려한
제조시스템에서의 계층적 흐름 통제 방법

Hierarchical Flow Control in a Failure Prone
Manufacturing System with Setups

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ABSTRACT

We propose a method for flow control of parts in a failure prone manufacturing system with machines that require setups. The control objectives are to keep the actual production close to the demand and to reduce the work-in-process inventory. A four-level hierarchical flow control model is developed to regulate production for the proposed manufacturing systems. At the top level, we collect the system data, establish the hierarchy structure, and calculate the second level control parameters. At the second level, we determine production and setup rates in response to changes in the repair state of the machine and the surplus. Setup times and short-term production rates are calculated at the third level. At the bottom level, actual dispatching times are determined. The control method specifies how to react to machine failures. It also tells how to allocate the stochastic system capacity among all the part types. Finally, a numerical example is provided to illustrate the mathematical control method developed.