

SIMULATION-BASED APPROXIMATE DYNAMIC PROGRAMMING APPROACHES FOR SEMICONDUCTOR MANUFACTURING OPERATIONS

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We present decision and control models for operations in reentrant line manufacturing (RLM) systems, e.g., in semiconductor manufacturing. The Markov Decision Process approach used commonly is set up to minimize the total work-in-process (WIP), which in turn indirectly minimizes cycle time (CT), the real objective sought. By viewing the problem in a novel way, we re-formulate it as one that seeks to select the best cost function leading to optimal cycle times. We also present results of a Markov Decision Process model, and extended simulation studies, based on a benchmark problem, using a simulation-based approximate dynamic programming method.