再制造系统的Drum-Buffer-Rope仿真建模

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摘要　运用DBR(Drum-Buffer-Rope)排程法和仿真工具ARENA，对废旧家电产品再制造系统进行了工艺流程仿真研究，建立了DBR仿真模型，实现了对工艺过程的动态监测；并详细阐述了如何应用所建立的DBR模型识别和解除再制造系统存在的资源约束，从而提高再制造系统的资源利用率和收益。仿真实验表明：该模型能够识别和消除资源约束及其影响，通过给出库存缓冲量BSc最优值，解除了约束工位排队延迟的现象，降低了供应的不确定性；同时也优化了系统的目标函数——资源利用率和净利润。

关键词　系统仿真；再制造系统；仿真建模 DBR排程法；资源约束

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Simulation modeling with Drum-Buffer-Rope for remanufacturing system

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Abstract Drum-Buffer-Rope scheduling method (DBR) and simulation tool ARENA were used to simulate the production process in a case of end-of-life home appliance's remanufacturing system. The simulation model of DBR was established and the dynamic checking for the remanufacturing production process was implemented. It was explained in detail how to make use of the DBR model founded to identify and eliminate the resource constraints, and therefore improved the recourse utilization rate and benefits of remanufacturing system. Outcomes from experimental simulations show that the DBR model enables to come true identifying and eliminating recourse constraints and their influences. By offering the optimal value of Buffer Size of DBR model, the phenomenon of queue delaying in the unit of constraint is eliminated and the supply uncertainty of remanufacturing system goes lower, meanwhile the objective functions as Recourse Utilization rate and Net Profit are also optimized.

Key words system simulation　remanufacturing system　simulation modeling　DBR scheduling method　resource constraints

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