ABSTRACT

IVELINE ANNE MARIE. A Design of Intelligent Decision Support System for Adaptive Production Planning and Inventory Control (PPIC) in the Food Industry. Supervised by ERIYATNO, YANDRA ARKEMAN and DADAN UMAR DAIHANI

Raw materials for the food processing industries include plant, animal and marine products, packaging materials, food ingredients and food chemicals. Characteristics of food industry raw material which is perishable and seasonal influenced the availability of the production input. Besides that, major food companies produce large quantities of semi-processed and consumer food products in continuous-flow operations, that must be utilized. The conventional PPIC Model cannot anticipate unpredictable problems and handle disturbances occurred in their production systems effectively. Thus, the objectives of this research were to develop a PPIC Model, which was suitable for food industry, and propose Disturbance Models to increase the PPIC function in order to control disturbances occurred in the production system. The research output was an Intelligent Decision Support System for Adaptive PPIC software, namely SPK IPRADIPA. SPK IPRADIPA can be used to apply the function of production planning and inventory control, which enable to adapt with the boundaries production system in food industries.

The developing PPIC models for food industry consist of Demand Management by Artificial Neural Network, Master Production Scheduling by Fuzzy Multi Objectives Linear Programming, Raw Material Inventory Planning by MRP and EOQ, Raw Material Inventory Control by Continuous Probabilistic Review System and Scheduling by Flow Shop Genetic Algorithm. Whereas, the Disturbances Control Model incorporating Operational Disturbances Control Action Sub Model, Disturbances Control Policy Follow Up Sub Model and Inventory Tolerance Sub Model. The disturbances control models can help in controlling the disturbances occurred and updating the safety stock for Raw Material and safety stock for Finished Good to adapt the PPIC System.

Keywords: food Industry, production system, PPIC models, disturbances control models, adaptive, safety stock