

Analysis and streamlining of ABB Swedewater material handling process

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This article is based on a study at ABB Swedewater in Landskrona. The aim of the study is to provide suggestions to improve the material handling process in production. The study has two main objectives. One objective focuses on reducing picking time. The other main objective is to reduce production disruptions caused by material deficiencies. The study provides several suggestions for improvement of both main objectives.

Keywords: Material document, value stream mapping, material stream mapping, process optimization, Toyota Production System

Background and problem discussion

ABB Swedewater in Landskrona is part of ABB Group Power Products division. ABB Swedewater manufactures and sells pure water-cooling facilities used in electric power transmission and for other various industrial applications. The facilities are built by customer orders and are often uniquely designed according to customer requirements. The components of the plants are built of both self-produced and purchased components.

Generally among industrialized warehouses, the main operational task is to supply the assembly or manufacturing with material; this is also the situation at ABB Swedewater. When manufacturing a product, the warehouse personnel pick necessary components, requested from other sections of the production. This stresses the

importance of a correct performance when picking, as this is the basis for the rest of the production.

Picking is time consuming and at times struggling with disruptions, primarily material defects and faulty pick lists. Disruptions results in delays that impair the production flow. To minimize disruption, a more efficient material handling process needs to be implemented.

Expected results and clarification of purpose

The objective of the company is to examine the handling and flow of materials in production. By streamlining the material handling process while eliminating production disruptions, a basis for an improved production flow will be generated. The objective of the thesis is to suggest a more efficient picking process with fewer material deficiencies.

The guidelines are to:

- Reduce time of picking orders, with at least 30 %.
- Reduce production disruptions caused by material deficiencies. At least 90 % of picked orders should be deficiency free.

Material deficiencies in production can be seen as a volatile concept and should therefore be defined. A picked order may contain the following material deficiencies: Missing components that are not in stock:

- Missing components available in stock;
- Wrong number picked components;
- Wrong components picked;
- Picked components with defects.

Method

The study use information and facts collected based on both qualitative and quantitative data collection methods. The synergy between the models provided a basis for a relevant decision-making and the creating of recommendations. A system approach is therefore used in the study. Furthermore, an abductive research method is used because the results are derived from a critical examination of values and observed processes.

Data collection consists of a literature review, interviews and observations.

Corporate analysis

To generate practically useful recommendations as requested by ABB Swedewater, the recommendations should preferably be customized to the business and its improvement needs. Therefore, customized recommendations are carried out by a survey and an analysis of the company. Initially, the current situation of ABB Swedewater was analyzed, and then the focus was put on key problem areas. Problems are only prioritized if they are essential to the thesis primary purpose.

Benchmarking

A benchmarking was performed against three companies with similar production to ABB Swedewater. The purpose of the benchmarking was to investigate the feasibility of the theoretical tools used in the thesis.

The benchmarked companies are listed below:

- Sandvik Construction and Sandvik Mining, Svedala;
- Huhnseal, Landskrona;
- ABB Power Products Transformers, Ludvika.

The benchmarking lead to valuable knowledge for generating and improving customized recommendations for ABB Swedewater.

Recommendations and suggestions for improvement

The analysis of ABB Swedewater focusing on Toyota Production System, material handling and value stream mapping resulted in identification of efficiency opportunities. Every perceived problem area that is relevant to the main

objective can be enhanced by a change to the developed recommendations.

The implementation procedure and ranking of the recommendations are estimated and determined by ABB Swedewater. The implementation of the proposed recommendations should result in fewer material deficiencies and reduced picking-time.

Recommendations have been identified in the following areas:

Standardization

The study resulted in two different recommendations for standardization. One in which material should be standardized, i.e. when designing new products, the component variation should be kept low. The other is the working procedures should be standardized, i.e. activities that should be performed in an more advantageous manner.

ABC classification

A suggestion of classification of the components in the warehouse has been developed. This proposal means placing frequent components on favorable inventory positions, in combination with the principle of equality, which can be explained by components that are often picked together should be placed close to each other.

Other material handling

Recommendations regarding optimization of restocks, optimization of shelf height, removal of non-frequent warehouse components

and roof over the outdoor storage have been developed.

Management of small components and supplies

Proposals for the storage of small components with a two-bin system, a version of a kanban system. Recommendations are also developed for investigating in a pater-noster and in need of storage of larger volumes.

Scanning system

A suggestion of the introduction of the scanning system has been provided. This system is expected to have the following impacts on inventory management at ABB Swedewater:

- Reduction of picking errors;
- Reduced handling errors in enterprise resource planning system;
- Time-efficient picking;
- Increased controll of stock levels.

Quality control

After a survey carried out in the assembly, it showed that 100% of defective components encountered in the assembly, came from the internal manufacturing. Therefore ABB Swedewater is recommended to introduce a quality control at the final stage of manufacturing to ensure the quality of components, which are then sent on to the next section of production.

Generalizability

The thesis resulted in recommendations that can be considered generalizable mainly because they are directed against a relatively wide problem approach. Benchmarking also revealed that the problem areas studied occur in similar industries and the theoretical tools used in the thesis are frequently used in similar companies.

The study is directed towards both the standard production, where the same components are used, and project production, where components are unique. This gives the study a wide range of business scope and the developed recommendations are valuable regardless of production. The study can also be used for educational purposes in production and warehousing.

Recommendations for further studies

Several areas have been identified for continued studies, which should improve the material handling process at ABB Swedewater further. The following suggestions have been recommended for future studies:

- Analysis of resource scheduling and planning of the workload load at the welding department.
 - Investigation of kanban systems with external suppliers.
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- Perform a detailed analysis of how the delays from the construction department can be avoided, where the importance of the problem have been described in the study.
 - When the inventory levels in the ERP system is reasonably realistic, an investigation and analysis of safety stock and order points should be performed in connection with customer forecasts.