Introduction of Production Cell at SWEP

-a Proposal for Material Planning and Control System and Evaluation of How to Lead and Manage Change

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This article is an extract of a Master Thesis in Engineering Logistics written at Lund Institute of Technology. The thesis was conducted at SWEP International AB at the production site in Landskrona, Sweden. The writer of the thesis has actively participated in a part of a Lean Manufacturing project at SWEP, consisting of creating a production cell that manufactures cover plates and choosing the planning and control system for this cell. The aim was to investigate how to plan and control the material flow in the created component cell. A part of the assignment was to evaluate how SWEP lead and manage a Lean Manufacturing conversion and give recommendations for future change projects.

Keywords: Lean Manufacturing, production cell, customer order point, change management

Introduction

In August 2004 a conversion to Lean Manufacturing started at SWEP International AB in Landskrona. As a participant in a part of this project the writer has been a member of two project groups, the first with the assignment of creating a production cell that manufactures cover plates and the second analysing and choosing the planning and control system for this cell. The choice of control system is of decisive importance for how SWEP will live up to the customers’ demands of delivery. The writer has chosen to focus on the question of where to place the customer order point. To improve future change projects an analysis of the Lean project has been made, which has resulted in the writer’s recommendations to the company about how to lead and manage change.

Method

The work began with practice on the shop floor, product education and introductory studies in literature of the suitable subject fields. As an active participant of two Rapid Improvement Events the writer has been working in project groups with other staff at the company and has in this way been expressing her own point of view and affected the current work. Mapping of the manufacturing process has been accomplished and based on data acquisition from the business IT system and interviews with staff in production planning and inbound logistics. The evaluation of the change process is based on interviews with staff and also on experiences and observations made by the writer.
Theoretical framework

Planning and control system for cells
Most companies adopt cells in an attempt to improve their internal and external response time to orders. Cells represent essential building blocks in efficient organizations; they are incomplete without a system that regulates material flows. This is why a cell system, and the plant as a whole require a manufacturing planning and control system, MPC, that plans, coordinates, and controls the two basic elements required to manufacture and move products: material and capacity.1 The big question is if you should use a pull or a push system. The critical factors are the number of different articles and the volumes of those articles.

How to manage and lead change
Kotter has developed an eight-stage process of creating a major change:
1. Establishing a sense of urgency. Examining the market and identify and discuss crises.
2. Creating the guiding coalition. Put together a team with enough power to lead the change.
3. Developing a vision and strategy. The vision should help direct the change effort.
4. Communicating the change vision. The guiding coalition should role model the behaviour expected from employees.
5. Empowering broad-based action. Change systems or structures.
7. Consolidating gains and producing more change. Use increased credibility to change all systems, structures, and policies that don’t fit together.

Mapping of the production process

To produce the plates, three operations have to be done: cutting, pressing and punching holes. The three operations are done in different machines. In the component cell there are one punching line to do the cutting, two presses and one small press to punch the holes. The material flow between these machines is complex.

8. Anchoring new approaches in the culture. Create customer- and productivity-oriented behaviour.2

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1 N. Hyer and U. Wemmerlöv, Reorganizing the factory, Competing through cellular manufacturing, p 311

2 J.P. Kotter, Leading Change, p 35-158
Analysis of and proposal for material planning system

The three proposals are based on different placement of the customer order point.

Proposal 1: The customer order point before the last operation. If the vision is straight flows and zero inventories, it will never happen with this proposal. To place the customer order point late in the process supports the market strategy and allows a big number of different articles. This is where the customer order point is placed today, which means it does not require any big changes. It is possible with the present equipment and staff.

Proposal 2: The customer order point in the middle of the flow. This means that the cutting line is a supplier of the one piece-flow in the rest of the cell. One order is created for the two operations, pressing and punching holes. A few investments in machines are necessary to allow setup of the machines more often. It is also needed to do changes in the business IT system.

Proposal 3: The customer order point before the first operation in the cell, a pure one-piece flow in the component cell. This strategy does not fit the strategy of the market. The cell is to be seen as one planning point and the task of the production planner is to provide the cell with raw material. There is a big problem with scrapped products. About 50 times a week there is an additional plate needed because of scrapped plates. With a one-piece flow it is necessary to setup all three machines to produce one plate. This is not possible with the present equipment. On the other hand maybe this can force SWEP to do something about their quality issues. To create a one piece-flow a lot of new investments is to be made in machines and the structure of part numbers is no longer needed. Changes have to be made in the business IT-system.

Concerning the push or pull question it is important to remember that to create a pull system in a cell the environment must be in a certain way. Pull systems is best suited for high volume products.

Analysis of the change process

The people at SWEP don’t feel that this Lean conversion is necessary. The sense of urgency is fundamental to succeed with the change. If the personnel are told that they are doing great and SWEP is doing great, why change? The keywords to communicate the vision are simplicity. In many of the discussions at SWEP, academic terms were used, which made the operators in the cell feel that they were inferior. It was hard for some people to express their opinion in a language they did not control. They have expressed that it does not matter what they say because no one would listen. If that is true, the change is going to fail because of the lack of the essential two-way communication. It is not in everyone’s nature to resist change, but SWEP seems to have this opinion. Everyone working at SWEP understands that SWEP will save money on this Lean conversion, but a reason why so many are sceptic to this change is that no one has told them what will be better for them.

Conclusions and recommendations

The optimal customer order point should be placed before the last operation in the cell, to maintain the flexibility in the process along with linking the manufacturing strategy to the actual needs of markets. The best
way of controlling the material flow in the cell is to use a mixed planning strategy with a Kanban system for the most frequent items and an MRP system for the less frequent ones. The items with a low usage should be produced directly to order. A recommendation for future change projects is, according to Kotter’s model, to establish a sense of urgency by creating a major crisis and even allow financial losses. There is an impending risk of sub optimization when focusing on one part at a time; consequently it is essential never to lose the overall picture. Negative attitudes can be controlled if you present the wins for “the little people” and allow discussions in a simple non-academic language where everyone can participate. It is a myth that it is in human nature to resist change.

References
