สำนักงานวิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER I

INTRODUCTION

The pilot factory to be studied in this thesis is deflection yoke (DY) manufacturer that its products are sent to both external customer and internal customer, Integrated Tube Component (ITC) section. In ITC section, the DY is assembled with Cathode Ray Tube (CRT) component to be finished product and send to the external customer later.

At the present time, demands of the CRT and DY products are increasing. A company that can respond customer demand quickly with reasonable price in intensifying competition will gain the competitive advantage. Therefore, in order to achieve this advantage, the company tries to improve productivity by eliminating bottleneck and rearranging the existing process layout that is the subject of this thesis.

Statement of problems

The main problems of DY process can be summarized as follows:

1. The deflection yoke process has not been set the standard time and unnecessary movements are done in some operations. Consequently, loses due to excessive movement occurred in the process.

2. There are totally 75 models of DY produced in 3 sizes, 14", 20", and 21" that require performing total work contents differently. Because they have not been allocated work elements to workstations appropriately, consequently, bottlenecks, idled time and Work in process (WIP) inventories are occurred in the process, and productivity also decreases. There are two workstations often

faced the bottleneck problems that is inspection station in case of producing DY for external customer, and withstand voltage checking station in case of producing DY for internal customer (ITC). Figure 1.1 shows DY output / day in October'00 that cannot be produced to achieve the plan.

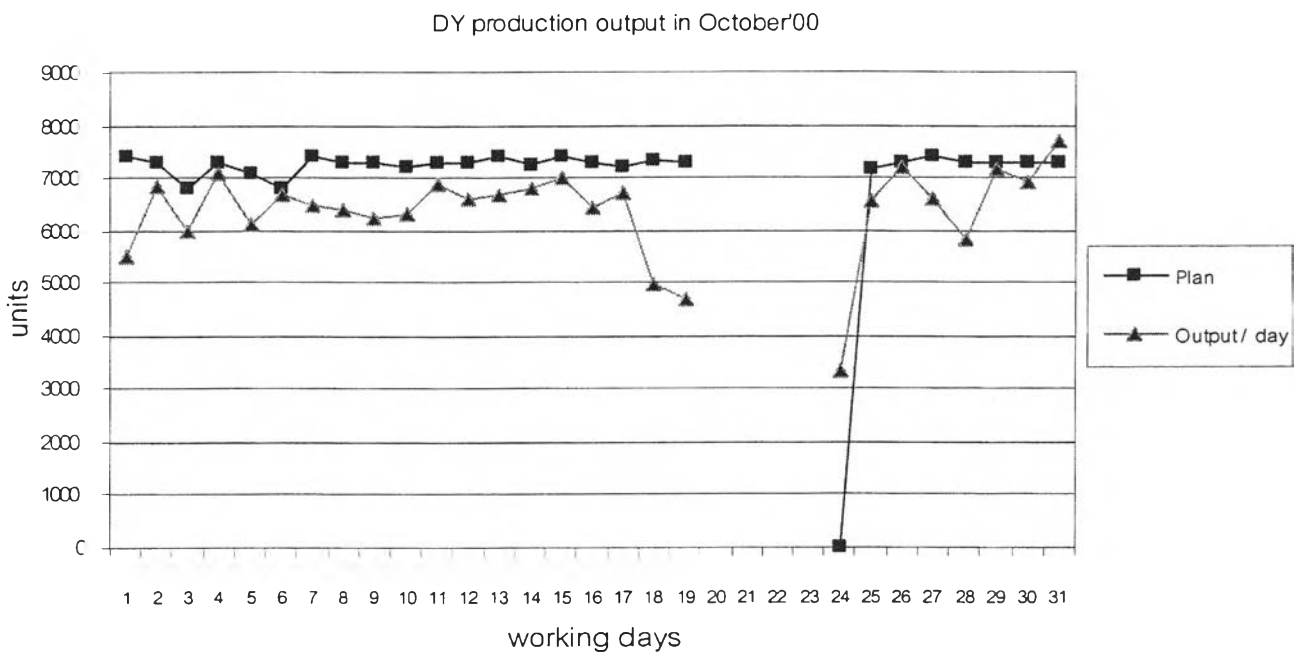

Figure 1.1: The comparison of DY output and production plan in October'00

3. Because the machines and some operations in the current process are located inappropriately and separate from the main assembly line, non-value-added movement occurred in the process.

Objectives of the thesis

The objectives of the thesis can be summarized as follows:

1. Reduce bottleneck problem in inspection operation and withstand voltage-checking operation.

2. Design the new process layouts based on flow of material concept in order to be the alternatives for the company to make decision for implementation in the future.

Scope of the thesis

The scope of this thesis can be summarized as follows:

1. This study covers whole DY process from H-coil winding operation to assembly, inspection and packing operation to be finished DY product.

2. This study is limited to representative models and assumes that the operators perform the same work element in the same manner.

3. The implementation of this study is concerned with standard operation improvement in inspection operation, design new workstation in withstand voltage-checking operation, balancing line and then compare and improve the result, evaluated from line efficiency and productivity index, from implementing the new system to existing system

4. This study is to propose the new alternative process layouts and compare the results from the new process layout (by simulation) to existing process layout.

Expected Benefits

This thesis proposes the improved methodology to eliminate the bottleneck and new process layout of the Deflection yoke process. Many benefits are expected to contribute the company as follows:

1. Eliminate bottlenecks of the process that cause the assembly line flows smoothly, then productivity increases to achieve production plan successfully, and WIP inventory also reduces.

2. Improve standard operation and then increase assembly line efficiency of the Deflection process.

3. Reduce non-valve-added movements due to excessive operation and ineffective process layout.

Methodology

1. Collect the related literatures
2. Study the collected information
   - Product description of all DY models
   - Process flows of all DY models
   - Processing time and work content of each workstation in detail by using motion and time study
   - Production volume and expected demand

3. Set standard time and identify the capacity of Deflection yoke process

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4. Develop the improved operation, design new workstations, balancing assembly line, and allocate manpower to the improved system in order to

   - Improve assembly line efficiency

     $$\textit{Line efficiency} = 1 - \frac{\textit{Total idle time}}{\textit{Total No. of workstation* cycle time}}$$

   - Improve assembly line productivity

     $$\textit{Productivity index} = \textit{Number of good products / Time unit}$$

5. Implement the improved system into the process.

6. Compare and improve the result from implementing the new system to existing system.

7. Design the new alternative process layouts and evaluate the results.

8. Write up the thesis

9. Prepare for the presentation in the final examination