

Final Pack Improvement Project to Increase Quality and Productivity

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ABSTRACT

Abstract —The final packaging line is the focus in this project at a medical devices company. Currently the actual packaging lines are human dependable. Final packaging process has been performing at a sub-optimal level. Quality events, scrap and manufacturing inefficiencies are the results of the human dependable processes. The pick-by-light system is an automatic solution proposed to eliminate the failure modes associated to the human dependable processes. The productivity will be higher with the implementation of the pick-by-light system due to the elimination of the manual literature assembly line. The company will be able to reduce considerably the quality and compliance issues by implementing this new system. DMAIC was the methodology used to identify and eliminate the failure modes. The pick-by-light system was identified as the main solution and it was implemented successfully.

OBJECTIVES

The goals are to standardize final packaging lines with the other global plants, implement automatic inspections and create Poke-Yoke stations. These goals will reduce the escapes and increase the productivity. Also, the applications of Six Sigma would help to reduce the amount of the operation cost. Different techniques such lean manufacturing were used to maintain a continuous improvement, while demonstrating the useful can be the DMAIC methodology to have an incremental improvement.

METHODOLOGY

The DMAIC methodology was used from the Six Sigma tools. The Define phase was completed by performing a process mapping of the actual process. The process mapping was used to show the escapes data. Next, the Measure phase consists of the data collection from the three different months. This phase permitted to know if there exists a patron in the escapes. The Analyze phase was to analyze the collected data with a simple descriptive statistics and a histogram graph. The purpose of these numbers was to compare them month to month and see the failures modes that have been causing the different escapes. Then it will be know how the failures modes could be eliminated. The fourth phase (Improve phase) was the implementation of the considerations and assumptions that had been derived from the data. The Control phase involves the monitoring of the improvements already in place. It should be noted that when the goal of this project is fulfilled, then the control phase should be employed continuously, so the escapes data could be monitoring by the sustain plan delivered. [1]

Define

The actual process of final packaging was defined to assure that the entire process was included. Final packaging process has been performing at a sub-optimal level. Quality events, scrap and manufacturing inefficiencies are the results of the human dependable processes.

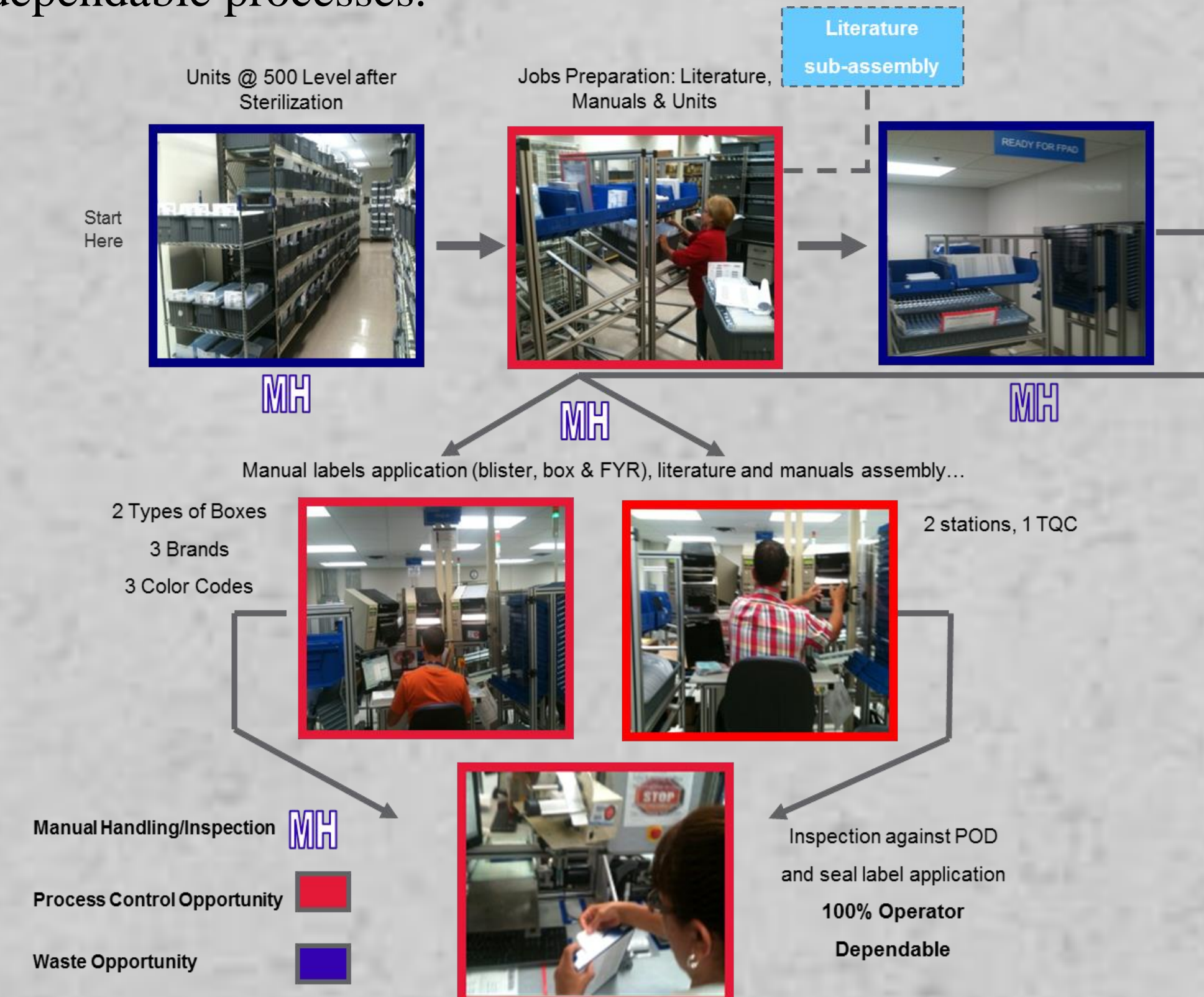


Figure 1
Detailed Actual Process of Final Pack

Measure

Quality data was collected in order to understand and identify the root cause for the escapes in the final packaging process. The final packaging process was measured to determine which errors or failure modes generate the escapes. The histogram permitted to know the higher offender. The major offenders were the Missing Literature, Mix Label, Wrong Unique Part Number, and Use Before Date Expired.

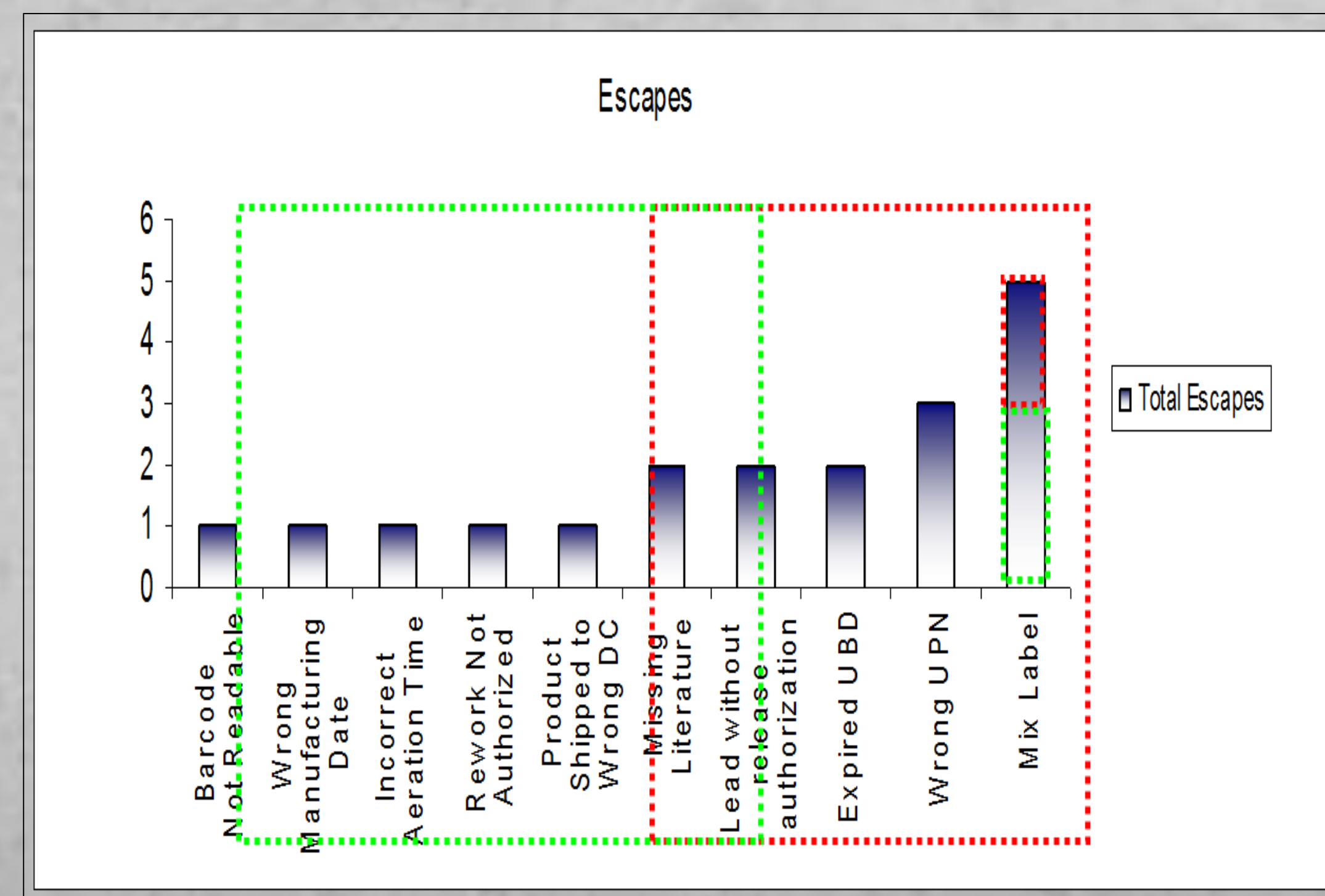


Figure 2
Escapes Segregation

RESULTS

Analyze

Different tools were used to identify the root causes of the offenders of escapes. The Figure 3 shows the root causes of escapes by errors. The focus ones would be Missing Literature, Mix Label, Wrong Unique Part Number, and Use Before Date Expired.

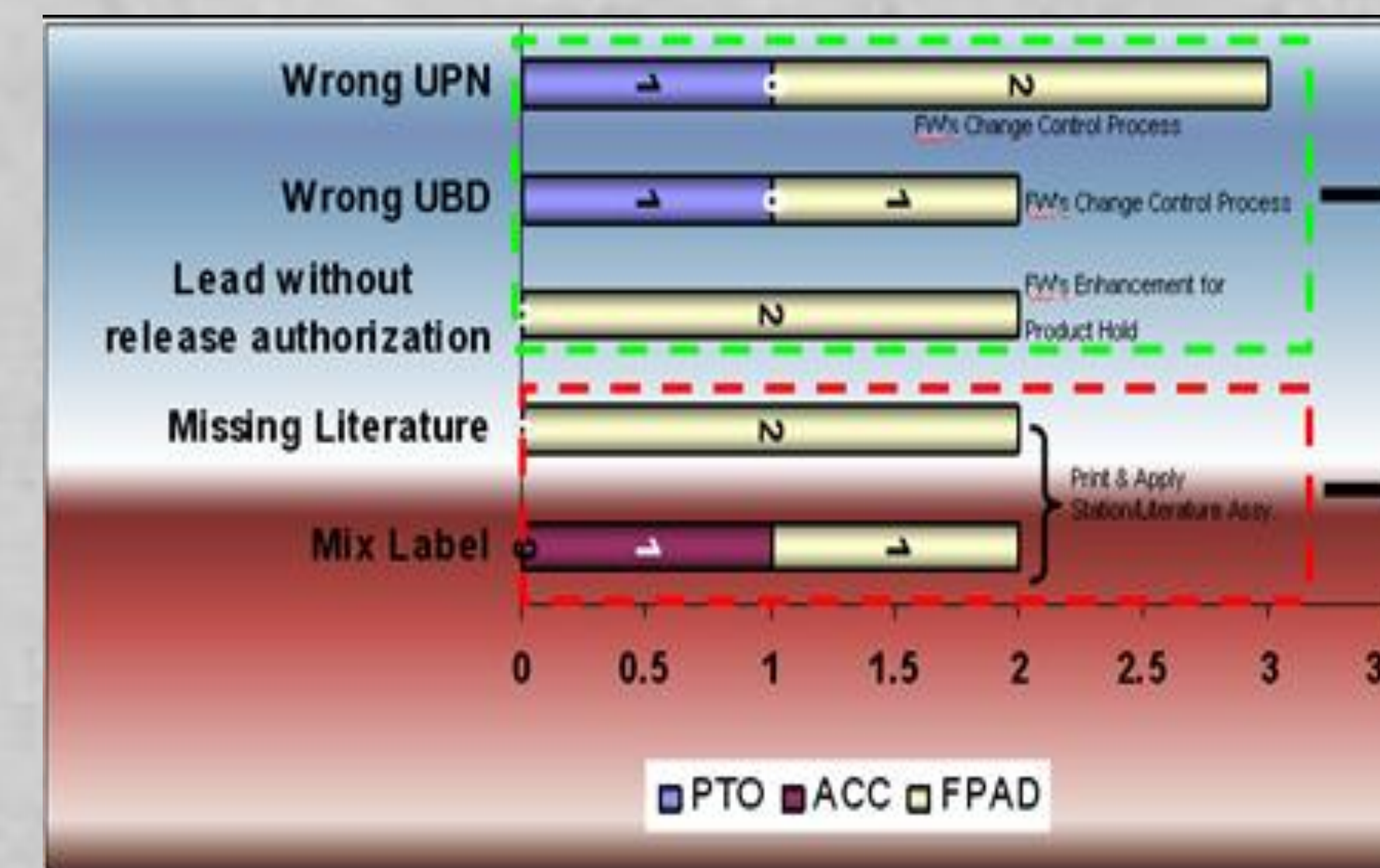


Figure 3
Graph of Escapes

Improve

This phase shows the implementation of the different tools. The real cause was the human dependable system. The causes of the problem were resolved after the implementation of an automatic solution. The installation of a new system of cameras and sensors was implemented to eliminate the human factor error. The inputs and the new final packaging line are show in Figure 4.

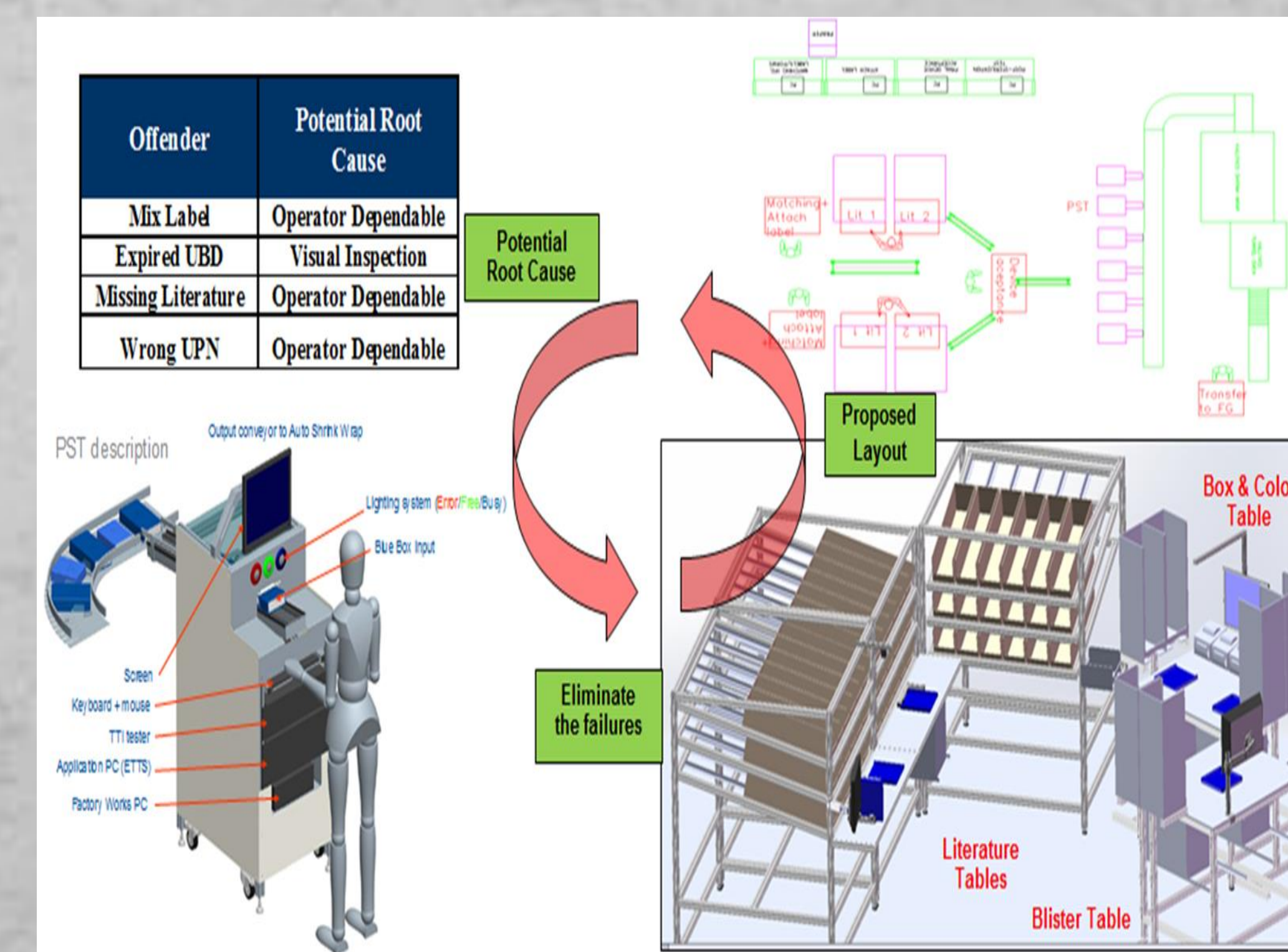


Figure 4
Assessment & New Final Pack Line

Control

The main goal of this phase is to delivers to the management the control of the improvement phase.

- ✓ Weekly meeting with Core Team & SMO.
- ✓ Website Site builder to post project updates and reference documentation.
- ✓ Work Packaging Team structure to support.
- ✓ Kaizen meetings and follow-up for labels inspections, parts loading and product segregation.
- ✓ Schedule of PM every month.

CONCLUSIONS

Manufacturing logistics was improved by implementing the pick-by-light system. This system enables the manufacturing companies to automatize the packaging process and inspections instead of depend of the manual process. With a simple change in the system the benefits are:

- The new packaging line will improve the quality control preventing labeling mix up and missing components. In turn, lean initiatives would optimize resources utilization.
- Standardization within the global site plants
- Productivity improvement in final packaging area
 - Lower lead time
 - Reduction in raw material inventory
 - Increased output 42% (lower head count requirements)

The main problem identified were the human dependable in the literature assembly, visual inspections, and non-automatized system. Also, the improvement was done producing an excellent result to the company decreasing the escapes in 100%. Manufacturing logistics was improved by implementing a lean manufacturing technique (the pick-by-light system). The escapes of the main offenders were around 14 before the implementations. The escapes decrease impressively to 0 after implementation. After two (2) months of project the goal in terms of escapes reduction was achieved.

REFERENCES

- [1] Maxey J.; Price M.; Rowlands D.; George M. "The Lean Six Sigma Pocket Tool Book". New York, NY: McGraw-Hill. 2005.
- [2] Womack, J., Jones, D., Ross, D. "The Machine that Changed the World". New York, NY: Macmillan Publishing Company. 2003.