Improvements to the Preventive Maintenance Process Performance at a Pharmaceutical Company

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Abstract

An analysis of the current performance of the Preventive Maintenance (PM) process was conducted for the four main areas of a pharmaceutical company: Manufacture, Utilities, Laboratory, and Facilities. The current performance of the PM process was found to be out of the expected target. Trends and detonating factors were identified, and four alternatives were implemented to improve the PM process performance. These alternatives included: cross training, improvements to the planning process, updating current procedures, and a continuous improvement and monitoring strategy to sustain the optimized performance. A significant improvement in the percentage of on-time PM completion has been observed. A continuous improvement strategy is in place to sustain the optimized performance.

Background

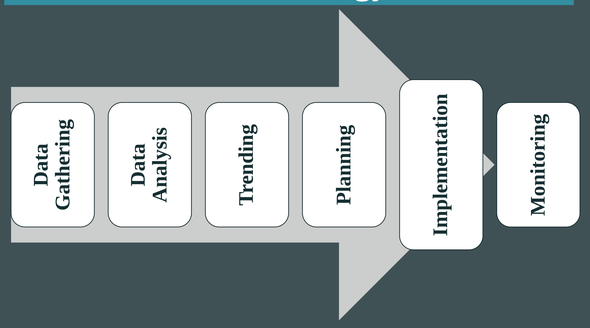
This project is based on the Preventive Maintenance (PM) of a pharmaceutical company that produces Intravenous Solution Bags. PM is used to sustain the performance of manufacturing processes. Nonetheless, PM cannot repair the assets to their original condition. There will always be a decrease in the performance based on asset wearing and aging [1].

The company presented a low percentage of PM completion, compared to the target of 100% in its four main areas: Manufacturing, Laboratory, Utilities, and Facilities. Therefore, the objective of this project was to improve the percentage of on-time completion for the PM process.

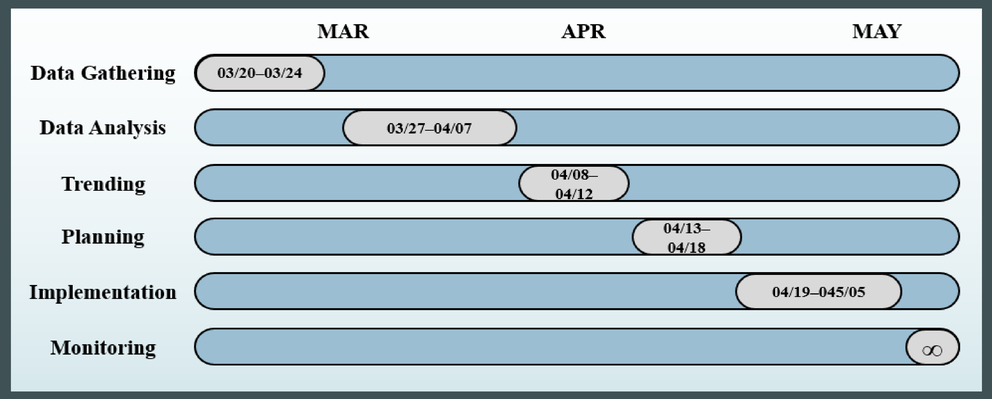
Objective

Improve the percentage of on-time completion for the Preventive Maintenance process.

Methodology



Project Schedule



Data/Trends

Table 1: Preventive Maintenance Assigned and Completed per Area/Department

Area / Department	PMs Assigned*	PMs Completed on Time
Manufacture	100	85
Laboratory	50	35
Utilities	120	96
Facilities	60	45

Table 2: Preventive Maintenance Classification per Area/Department

Area / Department	PMs Assigned per Category		PMs Completed on Time
Manufacture	Critical	56	56
	Major	4	4
	Regular	40	25
Laboratory	Critical	27	18
	Major	1	1
	Regular	22	16
Utilities	Critical	72	70
	Major	5	5
	Regular	43	21
Facilities	Critical	24	24
	Major	2	2
	Regular	34	19

Table 3: Preventive Maintenance Overdue Days per Area/Department

Area / Department	Month	Total PM Overdue Days
Manufacture	1	15.0
	2	12.5
	3	10.0
Laboratory	1	9.5
	2	10.1
	3	5.0
Utilities	1	13.1
	2	16.0
	3	16.5
Facilities	1	12.0
	2	16.5
	3	12.3

Results

Table 4: Preventive Maintenance Overdue Days and Completion Percentage per Area/Department

Area / Department	Average PM Overdue Days*	Percent of Completion
Manufacture	12.5	85%
Laboratory	8.2	70%
Utilities	15.2	80%
Facilities	13.6	75%

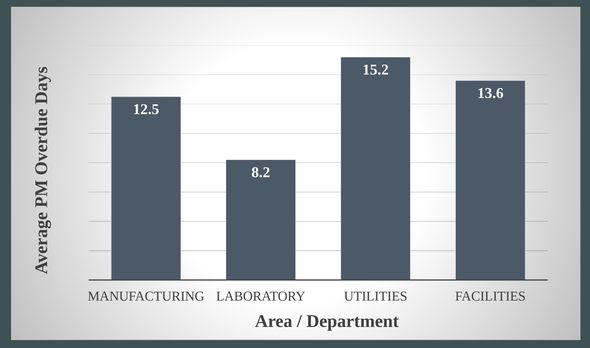


Figure 1: Preventive Maintenance Completion per Area/Department

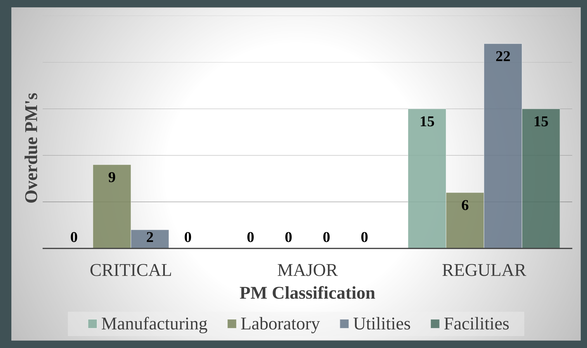


Figure 2: Overdue Preventive Maintenance per Classification

Improvement Strategy

With a better understanding of the current performance of the preventive maintenance process, it was possible to design some strategies. The first alternative was to provide cross training to personnel from different crews and within the same crew to increase the pool of expertise for tasks that have been performed by a single individual. The second path was to evaluate the planning tool on the maintenance platform to restructure the release date of PMs from a batch mode to a more segregated way, to decrease the load of work per day. The third approach was to update current procedures and train the maintenance crews, so they have a better understanding of prioritization, and also to reinforce the good documentation practices when recording PM records. The fourth measure was to evaluate the increase of the headcounts in areas in which the previous measurements were not enough to improve the process.

Continuous Improvement

The fifth and last measure was to implement a weekly monitoring of the process once the implementation of the approved measures was completed, to address any immediate issue that may impact the performance of the process.

Conclusions

For a manufacturing company to operate efficiently, equipment, utilities and related systems need to be at their optimal condition. Preventive Maintenance is one of the alternatives employed to achieve this objective. The performance of the PM process on the four main areas of the pharmaceutical company was found to be beyond the expected target of 100% on time completion. Trends and detonating factors were identified from the evaluated data and alternatives were implemented to improve the PM process performance. As part of the continuous monitoring strategy implemented under this project, a significant improvement in the percentage of on-time PM completion has been observed. Therefore, under the continuous improvement methodology of the company, the monitoring process will continue assessing issues that may impact the performance of the Preventive Maintenance process and searching for alternatives that increase the sustainability of the impacted assets.

Reference

[1] M.A. Coque, Jr. & G. F. Souza. (2014). “Optimal maintenance time under Imperfect Preventive Maintenance”. Vulnerability, Uncertainty, and Risk. https://doi.org/10.1061/9780784413609.254