

Improving Supervision and Feedback in the Maintenance Department of ABC Food Manufacturing Plant

*Christian R. Ramos Gonzalez
Master in Engineering Management
Prof. Héctor J. Cruzado, PhD
Graduate School
Polytechnic University of Puerto Rico*

Abstract — *The ABC Food Manufacturing Plant has not trained its maintenance personnel in the implementation of new techniques for better key performance indicators. After a DMAIC analysis was performed on how to improve the supervision and feedback on the maintenance department, it was found that there was a gap of skilled personnel. There was the recommendation and implementation of training its personnel to be more versatile, including the data entry personnel to give support. The result was an increased time in uptime by having operators along with the guidance and support of technicians as a Predictive Maintenance program.*

Key Terms — *Computerized Maintenance Management System, Data-driven Decision Making, DMAIC, Inventory Evaluation, Key Performance Indicators, Mean Time to Repair, Overall Equipment Effectiveness, Parts Usage, Predictive Maintenance, Uptime.*

PROJECT STATEMENT

The ABC food manufacturing plant processes and packages grains (such as different types of rice) and stores and distributes corn, soybean, and other similar products. The maintenance department of this company is responsible for keeping all equipment and machinery running properly to ensure efficient operations. However, management skills in the department have not been updated and enhanced. Specifically, there are deficiencies in planning, organizing personnel and resources, leading teams effectively, and implementing feedback processes. As a result, the maintenance department is struggling to meet the objectives for continuous improvement and growth set by upper management and aligned with the company's culture.

The objective of this project is to improve the performance of the maintenance department. By meeting this objective, supervision, communication, and feedback within the maintenance department will be improved. This will enable the department to increase efficiency, better meet management targets, and align with the culture of continuous growth at the ABC food manufacturing plant.

The methodology used to achieve the improvement of performance was DMAIC. The scope of work would be based on providing maintenance managers and supervisors with leadership and feedback training to enhance their skills. The data was taken from the KPI based on the system used by the department. Different methods of Lean Six Sigma were used, like fishbone diagrams, and others. The effectiveness of the tasks performed and the time taken to inspect these tasks were analyzed to ensure that they were performed as expected and if not, to correct these actions. To improve performance, methods and technics that have been implemented by big companies which are in accordance with the department context were analyzed. To maintain control of the project, a monthly maintenance report was developed to track key performance metrics, guide data-driven decision making, and to conduct quarterly department surveys to gather employee feedback on supervision practices and areas for improvement.

ANALYSIS

Technicians and supervisors were interviewed to receive feedback on the department's performance. The main insight was the lack of verifying the work done. This created a confidence gap between work done and the supervision. This

was an issue because there has been no specialized training on how to supervise maintenance works, and how to properly measure this performance to know where to make adjustments and who should make them.

Aside from the lack of knowledge of how to supervise, another issue was the time taken to perform this kind of inspection on works done. There should be at least two supervisors to have proper inspection and keep going with the workflow.

In Figure 1 there is a 94.72% of preventive maintenance (PM) completion performance. This performance is not enough to maintain a high level of productivity. It is necessary to achieve more in other areas.

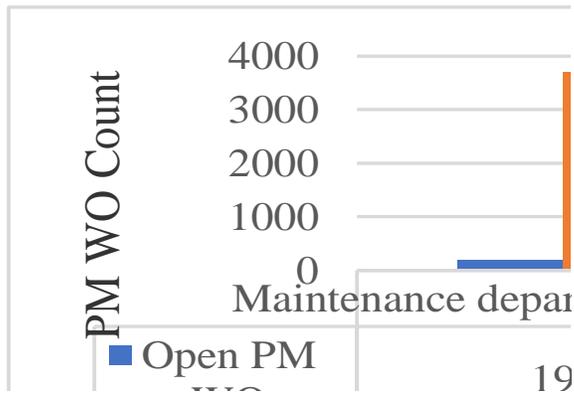


Figure 1
Work orders of preventive maintenance (Open/Closed) 2023

RECOMMENDATIONS

It was recommended to have the supervisors complete some maintenance management courses to understand how today's industry functions with KPIs. There are few certifications that are available like: Certified Maintenance & Reliability Professional (CMRP) provided by the SMRP; Certified Plant Maintenance Manager designation by the AFE; CMMS training provided by the software support itself in most cases;

IMPLEMENTATION/PLAN

It was implemented that the maintenance department data entry personnel for parts inventory

had a training on the eMaint software CMMS to help on the reports of the department's performance and feedback from other departments. Training was given to machine operators as well as technicians to help in the daily maintenance and early detection of failures. This is a way of implementing predictive maintenance (PdM) without much technology.

The recommendations to have supervisors complete additional maintenance management training were implemented over the past [time period]. Several certifications and courses were suggested, including the Certified Maintenance & Reliability Professional (CMRP) program and internal CMMS training. The goal was to improve the department's overall equipment effectiveness (OEE) and key performance indicators (KPI).

The following training programs were rolled out:

- CMMS software training for inventory and data entry. This also covered how to obtain reports on the parts used, MTTR, OEE and uptime. Two of the staff completed this.
- Operator and technician training on preventive maintenance and early failure detection. 7 from the maintenance department, and 4 from operators from the production department of personnel participated. The training focused on early detection of wear and how to do custom preventive maintenance.

CONCLUSION

The uptime increased as the machine MTBF decreased due to PdM and customized PM based on the time and environment of machine usage.

Inventory reporting has improved since the CMMS training. Stockouts are down and inventory accuracy has improved. This has reduced downtime for the maintenance team.

Technicians have been able to identify potential failures earlier thanks to the operator training program. OEE has increased, which proves the company is experiencing less downtime.

In summary, the training programs have equipped maintenance personnel with additional

skills that have translated to measurable operational improvements. KPIs like OEE, inventory accuracy, and downtime have all moved in the desired direction. Continuing to build capabilities through training remains a priority.

REFERENCES

- [1] Fitch, J. (2016, August). *Machinery Lubrication*. Retrieved from Why Inspection 2.0 Is Your Best Strategy for Early Fault Detection: <https://www.machinerylubrication.com/Read/30562/inspection-fault-detection>
- [2] Corporation, N. (n.d.). *How an Improved Lubrication Program Enabled Simmons Feed to Cut Downtime by 50 Percent*. Retrieved from <https://www.machinerylubrication.com/Read/31304/simmons-lubrication-program>
- [3] Gilmer, L. (2022, July 15). *FacilitiesNet*. Retrieved from 4 Steps to Successful Training: <https://www.facilitiesnet.com/facilitiesmanagement/article/4-Steps-to-Successful-Training--19587>
- [4] Friday, S. (2023, November 6). *FacilitiesNet*. Retrieved from The First 100 Days as a Facility Manager: What You Need to Know: <https://www.facilitiesnet.com/facilitiesmanagement/article/The-First-100-Days-as-a-Facility-Manager-What-You-Need-to-Know--20018>
- [5] QualityMedDev. (2021, September 6). *Equipment Maintenance: ISO 13485 Requirements*. Retrieved from <https://www.qualitymeddev.com/2021/09/06/equipment-maintenance-13485/>