CLEAN IN PLACE RECIPE OPTIMIZATION

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Abstract

This improvement project was based in reduce the fixed tanks and transfer lines Clean in Place (CIP) recipe execution by consolidating the Water for Injection (WFI) rinse and the WFI CIP recipes into one single recipe. This new recipe was used when system is employed for WFI collection and buffer preparation processes. DMAIC methodology was used as a tool to present the information required for the project. Is a series of steps used to measure the waste in an industry and improve the efficiency of it. These steps are Define, Measures, Analyze, Improve and Control. After implementation, a standard work was generated to be aligned with the time expected for each stage of the process. In general, the project obtained successful results reducing the new recipe 21% after the optimization performed in the process.

Background

Clean In Place (CIP) is a method of cleaning that provide the elimination of the residues of a tank and transfer line with a recipe. The tank and transfer line are in stainless steel material and required some chemicals to be cleaned.

Problem

The goal of an improvement project is to reduce the fixed tanks and transfer lines Clean in Place (CIP) recipe execution by consolidating the WFI rinse and the WFI CIP recipes into one single recipe. This new recipe was used when system is employed for WFI collection and buffer preparation processes.

Methodology

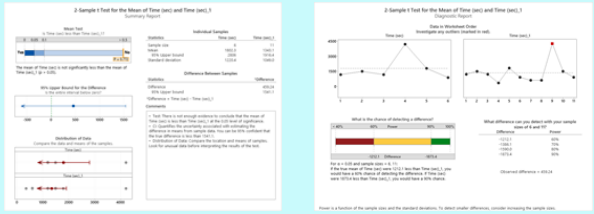
DMAIC

Results and Discussion

The results of the project were successful because the method used was the correct one. The method use was the integration of two cleaning recipe to one of the fixed tanks and transfer lines. The initial recipes took a time of 4.10 hours overall.

Recipe 1	Time (sec)	Recipe 2	Time (sec)
Documentation	1200	Documentation	600
Drain	1500	PHT	600
PHT	1200	Cleaning cycle	4214
Rinse	360	Drain	1500
Drain	1800	Documentation	900
Documentation	900		

Recipe of Rinse and CIP



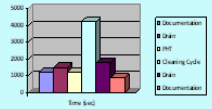
Hypothesis Test

2-Sample *t* Test for the mean of Recipe Optimization/Time (sec) and Old Recipe/Time (sec) were identified to represent the null hypothesis and alternative hypothesis with the results.

Results and Discussion- con't

A new recipe was created and tested to evaluate the impact in the process, documentation, and system. After different types of test, the recipe culminated with a good improvement considering the recipe time reduced in 21 %. Finally, the observed recipe cycle time was 3.23 hours, a reduction in time consumed in each stage.

Recipe Optimization	Time (sec)
Documentation	1200
Drain	1500
PHT	1200
Cleaning Cycle	4214
Drain	1800
Documentation	900



Recipe Optimization

Standardized work is a very common tool used in the manufacturing areas due to the associated measure, the time for each stage after mean calculated for the execution of the co-workers, and evaluation of any task.

Conclusion

As the research has demonstrated, the project required the support of areas impacted for the improvement. The areas impacted were documentation, system, and automation. Test results were successful, and the project improvement has benefits for the area as of equipment availability, better labor utilization, and improve cycle time. The benefits are related to efficiency and agility for the process and area. Results can be defined as 21% of reduction in the recipe after the consolidation of two recipes in one, and the final time of the recipe optimize was 3.23 hours instead 4.10 hours.