ENGG 390: Master of Engineering Management Project

Abstract & Executive Summary

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Abstract

IDEX IH&S is a global leader in life science fluidics, microfluidics, and optics. Ball seats, a legacy product, support $4.85M revenue for their Middleboro, MA site. Over the past couple of years, the Ball Seats department has been facing a challenge with an On Time Delivery rate of 59%. My project examines ways to improve inefficiencies and optimize the production process. I accomplished these goals by leading a Value Stream Mapping rapid improvement event, collecting and analyzing data through Standard Work studies, and introducing a new flow on the production floor that resulted in a 40% increase in throughput.

Executive Summary

Founded over 30 years ago, IDEX is a global enterprise committed to making trusted solutions that improve lives. IDEX is composed of 40 diverse business. My internship was with IDEX Health & Science, a global leader in life science fluidics, microfluidics, and optics. My position was as an Accelerated Management Program engineering intern.

My primary role was serving as a Project Leader for the Ball Seat Production Process Improvement project. Ball seats, used in check valves, are a legacy product for the Middleboro, MA site, and they support over $4.85M revenue. Over the past few years, the Ball Seat department has been facing a challenge with On Time Delivery (OTD). It had achieved only a 59% OTD rate for customer request dates from January 2018 through May 2021. My project aimed at exploring the cause of the low OTD rate and examining ways to optimize the production process.

My responsibilities included leading a cross-functional team of seven, developing and executing an action plan to optimize the production process, collecting and analyzing data, applying Lean tools and principles, running work cell simulations, and ultimately implementing changes out on the production floor. The project composed of three phases: (I) Value Stream Mapping Rapid Improvement Event, (II) Operator Standard Work and Leader Standard Work, and (III) Implementation of Single Carrier Flow.

During Phase I, the team and I worked together to perform time studies, identify bottlenecks and constraints, identify wastes in the process, examine pain points, map out the Current State, and define a Future State Map consistent with a Visual Factory. From the outcomes of the Value Stream Mapping event, I created an action plan and used 80-20 methods to prioritize activities with most impact and timeline feasibility.

During Phase II, I collected and analyzed data, created Standard Work for selected operators, and defined value-added and non-value-added operator tasks. I examined operator load and utilization and level-loaded redistribution of operator activities. I also worked with leaders in the Ball Seat production area and leveraged Lean tools to define Leader Standard Work and response protocols for interrupters.

During Phase III, I constructed a makeshift work cell, conducted timed studies, ran simulations for single carrier flow with operators and leaders to examine pain points in the new process to correct prior to deployment. I led implementation efforts by working with operators and leaders to identify new machine cycle times, established a streamlined process flow, and created artifacts for the new process.

Overall, the project resulted in the following outcomes: increased throughput by 40%, Work-In-Progress (WIP) reduction by 53%, productivity gains of $20K annually, and increased process stability and visibility. With the new production process, the Ball Seat department was able to produce 7 lots per day, necessary to meet a 100% OTD rate.