Hydroid

A Kongsberg Company

Hydroid Gets Lean

GBMP CASE STUDY

WEBSITE:
www.hydroid.com

INDUSTRY:
Manufacturing, Marine Research, Commercial & Defense

EMPLOYEE COUNT:
>200

About Hydroid

Located in the U.S. and a subsidiary of Kongsberg Maritime, Hydroid is the world's most trusted manufacturer of advanced, field-proven Autonomous Underwater Vehicles (AUVs). Hydroid's REMUS AUVs and marine robotics systems provide innovative and reliable full-picture solutions for the marine research, defense, hydrographic and offshore/energy markets.

About the Engagement

With the ability to dive to depths of 6,000 meters, explore shallow waters and hover in hazardous areas where navigation is difficult, REMUS AUVs can be used for a number of applications. They have been involved with undersea mine countermeasures that have helped save lives by eliminating human divers from mine fields. Additionally, REMUS AUVs have helped solve plane and shipwreck mysteries, including locating Air France Flight 447 wreckage, generating 3D mapping of the Titanic, and finding the USS Indianapolis at a depth of over 18,000 feet. REMUS AUVs also offer scientists a new view on pressing global issues including climate change, the world's declining fish population and environmental disasters.

"Hydroid has made a significant commitment to the Lean program both with time and resources. The Workforce Training Grant consisted of 89 days (712 hours) of training and practice. Each class was attended by 10-12 employees (Management and Direct Labor). Their commitment is certainly evident." - ***Bob Elliott GBMP CI Manager***

Hydroid

A Kongsberg Company

Hydroid Gets Lean

A culture shift was needed and, after the early elimination of some of the common sources of day-to-day frustration, things started to change. Ideas for improvement started coming from different areas within the company, and the concept that it was ok to ask "why" things were done a certain way became more widely accepted.

Lean Take 2

Since its origin in 2001, Hydroid has grown from a company with a few employees to over 200 employees today. With the company's steady and consistent growth over the years, it became evident in 2015 that there was a need for change. Although the company had made efforts toward becoming Lean in the past, Hydroid's leadership proactively searched for ways to better implement the process and build the business. With the help of The Greater Boston Manufacturing Partnership (GBMP) and funding through the Massachusetts Workforce Training Fund, Hydroid renewed its commitment to the Lean process. Since reviving this process implementation in 2015, several employees have earned their GBMP Lean Certificates, with some continuing on in pursuit of their Society of Manufacturing Lean Bronze Certifications and Six Sigma belts. Today, Hydroid employees regularly participate in Lean improvement initiatives to steadily remove waste from the company.

Lean Paves the Way for Improvement

In terms of Lean procedures, the material handling and production departments were identified as areas within Hydroid that were ripe with opportunity. As with any change, when Lean was first reintroduced, there were obstacles to overcome. One significant hurdle was getting employees to trust and believe in the process. Most production employees initially thought the Lean concepts could not be adopted simply due to product variety and complexity. There was also the belief that an immense amount of "local expert" or "floor lore" knowledge was required to build Hydroid's wide range of products. A culture shift was needed and, after the early elimination of some of the common sources of day-to-day frustration, things started to change. Ideas for improvement started coming from different areas within the company, and the concept that it was ok to ask "why" things were done a certain way became more widely accepted.

Hydroid

A Kongsberg Company

Hydroid Gets Lean

A color-coded system has been established to identify different areas for material and production stages, and over a dozen dedicated work cells have been added without increasing the footprint of the production area, increasing production capacity by over 50%.

The Production Dashboard

Since 2015, several significant initiatives have been put into place. One key change was the development of a digital Production Dashboard to support the visual control of the production team and schedule. Today, everyone at Hydroid has the ability to see what is 'in-process' on the production floor at any time. The production manager & team leads are able to monitor and adjust the production plan by assigning tasks, setting priorities and defining time estimates to support accurate capacity planning. The assemblers, in turn, can easily see their upcoming assignments. When there is an issue, they can seek support by updating their production status. In the past, these functions were typically done manually; making the process very labor intensive and impossible to maintain. The digital dashboard makes it possible to provide updates from any computer. Additionally, iPads have been installed in key areas on the production floor for locating manufacturing orders (MOs) and to update relevant information as soon as it is changed.

Value Stream Mapping

Through the use of Value Stream Maps, multiple processes have been documented to identify how different material and products move through the facility. Hydroid continues to use this information to improve the production floor plan, all in the effort to reduce unused space and ease the movement of people, material and information. A color-coded system has been established to identify different areas for material and production stages, and over a dozen dedicated work cells have been added without increasing the footprint of the production area, increasing production capacity by over 50%.

Hydroid
A Kongsberg Company

Hydroid Gets Lean

As a result of these new tools and processes, Hydroid has improved on-time delivery and kitting accuracy. The most significant achievement has been reduction of defects, as well as a large reduction in material handling labor.

Material Handling & Additional Improvements

The material handling and kitting process was improved through the creation of a “floor stock” station in the production area, which was replenished with a Kanban card system. In situations where stockroom employees would previously pick each piece of hardware for every kit, portable Assembly Hardware Kits are now available so that assemblers can quickly pull the exact hardware they need for their unique assembly without the need for someone to pull and count every item. This has reduced the time required to kit every order by over 60%, improved kit accuracy, and has helped to eliminate the once common problem of running out of frequently used parts. Some of the other additional improvements include the creation of a Training Matrix to identify training gaps and, subsequently, create development plans. Also, the internal documentation process has been improved and the amount of inventory and work-in-process has been reduced.

Hydroid's Lean Success

Manufacturing Defects per 1,000 hours of labor

2015 – 3.5 defects/1,000 hrs
2016 – 3.2 defects/1,000 hrs
2017 – 2.3 defects/1,000 hrs

Material Handling Hours as percentage of manufacturing hours

2015 – 16%
2016 – 14.8% (Changed to Floor stock/Hardware Kits mid-year)
2017 – 5.7%

From making processes more efficient by removing unnecessary handling and processing, to improving the quality built directly into products through better designs and documentation, Hydroid has continued to stay focused on improving every aspect of their production cycle. When Hydroid now looks at all of the Lean improvements they have implemented over the past few years, they see orders being completed more efficiently; an improvement in the on-time delivery of spare parts orders; and a reduction in the turnaround time for order fulfillment.

Hydroid
A Kongsberg Company

Hydroid Gets Lean

To date, Hydroid has conducted 4,444 hours of Lean training and will continue their training with GBMP. The goal is for all areas of the organization to be involved in the LEAN journey; cultivating a "Continuous Improvement" culture and promoting a continued focus on identifying and removing waste from products and processes.

Hydroid's Lean Success

Ken Kern, Director of Operations at Hydroid, is impressed with the result. "When we first rolled out the concept of Lean, it was met with a lot of skepticism, especially from long term employees who had seen it fail once already at Hydroid. We selected a team of employees to receive advanced Lean Bronze Certification Training from GBMP and to be the leaders in the implementation in the organization. Once the training began and improvements were seen, everybody got on board. Lean has fundamentally changed the way we operate throughout the production process, and the culture of continuous improvement is the way we now conduct our business. The application of real-life problems that GBMP embeds in their training has been a key to the cultural change."

Hydroid's adoption of Lean was evident in November 2018. Daryl Powell, Lean Programme Manager for Kongsberg Maritime Subsea in Horten, Norway, conducts Gemba walks through all KM Subsea organizations each year as well as the Lean maturity on the factory floor. This process is based on the Rapid Lean Assessment (RLA) technique detailed in Goodson's (2002) Rapid Plant Assessment (from "Read a Plant Fast", Harvard Business Review). Daryl invited special guest James Womack, Lean author, founder and Senior Advisor at the Lean Enterprise Institute (and Lean author of The Machine That Changed The World, Lean Thinking, Lean Solutions, and Gemba Walks) to participate in the RLA. In the two short years since the implementation of Lean, Hydroid achieved the top rating in all of KM Subsea, and Mr. Womack gave the highest ratings to all who participated in the assessment. He commented that he has toured hundreds of facilities, and Hydroid's adoption of Lean on the factory floor rates among the top organizations he has toured, and that Hydroid has accomplished a lot in a short amount of time.