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## Company Background

Lou-Rich Inc., is a contract manufacturing and engineering company based in Albert Lea. The company manufactures complete products, weldments, engineering components, and high level assemblies. It provides customers with help in quality assurance, material sourcing, and design of products. Other services include machining, fabricating, finishing, welding, painting, wiring, assembling, testing, and packaging. It provides services to original equipment manufacturers (OEMs) in the agricultural, construction, food service, industrial, medical device and medical equipment markets.



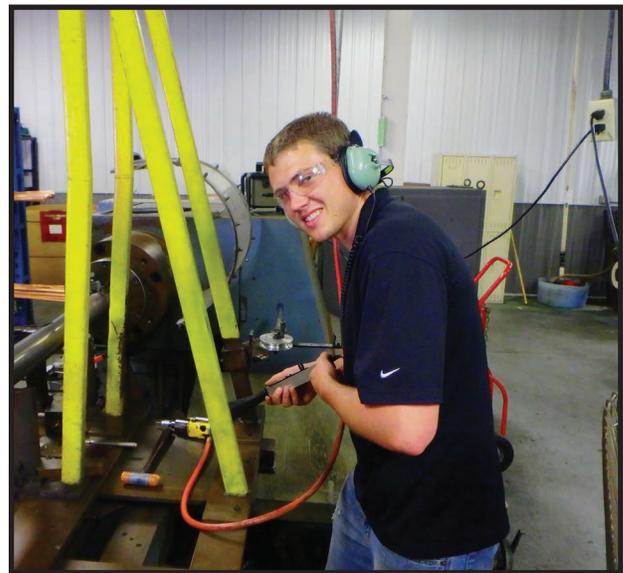
*"I really enjoyed this internship because it enabled me to use the skills I have gained through my coursework and apply them to a project that really had a positive impact on the company. I particularly liked learning about lean manufacturing principals because the idea of eliminating sources of waste through continuous improvement is something that can be applied in any industrial setting." ~CT*

## Project Background

Lou-Rich has been manufacturing freezer assemblies since 1989. Over the years, the types and designs of freezers have changed and many have been removed or added to the line. The production area size has been gradually reduced and its location and work cell layouts have changed many times. It was moved to its current location in 2012 and the work cells were compacted into a smaller area. The goal of this project was to determine and reduce sources of waste in this production line by optimizing product flow and implementing lean manufacturing solutions to ensure the best use of the remaining space for the process.

## Incentives To Change

Lou-Rich, Inc. is committed to reducing waste and continuous process improvement through the use of lean manufacturing principles. Current analysis of the freezer line where this project is focused shows that there is an opportunity to reduce many different kinds of waste such as motion, inventory, chemicals, idle time, transportation, and water. The creation of a system that will process materials more efficiently will reduce these wastes. This will save the company money in operator time and associated production costs. It will also reduce the production lead time for freezers and will allow increased production and profit for the company during the year.



## Solutions

### Purchase New Washer and Place in Freezer Area

The current washer used to clean components in the freezer area is located about 350 feet away from the line. This causes operators to spend a lot of time taking parts to the washer and back. This waste reduction opportunity is estimated to save 280 hours per year or about \$7,700 in operator time. Operators must be paid to run the washer

and load and unload parts; reassigning them to other areas could save about \$2,550 per year. Forklifts must be used to transport parts to and from the washer and then back to the freezer line; this time reduction equates to a savings of \$1,750 per year. The new design of the washer is estimated to save 29,300 gallons of water per year. By combining all of these savings together, new washer implementation would save approximately \$12,200 per year.

### Implement Standard Work at Foaming and Coiling Operations

Through lean analysis, it was determined that production processes in the foaming and coiling operations could be accelerated by making simple changes in operating procedures. By implementing standard work in the coiling and foaming processes, it could save operators 420 hours per year where they could be assigned to other work areas. This equates to about \$11,550 per year in operator time. There are also energy savings associated with not having to heat the foam molds which equal \$370 per year.

### Remove Current Coil Washer

The current coil washer is believed to be unnecessary to meet customer requirements. During foaming, an air hose is applied to each freezer that blows out any debris that may be in the coil. This, combined with the new washer implementation, is expected to provide the required cleaning. If approved by the customer, this could save \$13,200 per year in chemical, water, and power savings.

### Rearrange Layout and Implement Conveyor System

The current layout and equipment are not optimized, and require operators to move excessively in their work cells and they require a lot of operator time handling part containers. The intern suggested that a new layout be implemented to reduce operator movement, and that a conveyor system be implemented to reduce time spent by operators to move parts to and from the work cells. Implementing a conveyor system would clear room on the factory floor and eliminate time handling parts containers. These changes are estimated to save operators



260 hours in handling time per year or \$7,100 per year. Furthermore, these changes will help balance process flow and organize the work place.

### Implement Finished Good and Component Supermarket

Due to continuous changes in order sizes by the customer, The intern recommended a finished goods supermarket be installed. The supermarket would implement a pull system that would enable the line to only make parts as the customer needs them. This is different than the push system used that relies on predictions of customer demand which is hard to do with fluctuating order sizes. This would help buffer against the order fluctuations, prevent against excess material handling, and lower the amount of components in work cells.

The current component storage areas are located far away from the welding and soldering areas where all components are combined together. The new supermarket will be located closer to those areas with less movement to and from storage area. This solution can save operators approximately 50 hours per year or \$1,400 in operator time. It will also allow parts to be shipped to customers faster and create a more structured, organized work environment.

Recommendation	Annual Time Savings (hours)	Annual Reduction	Annual Savings	Status
Purchase New Washer	280	29,300 gallons	\$12,300	Proposed
Implement Standard Work	420	4,800 kWh	\$11,900	Implementing
Remove Coil Washer	---	19,200 gallons 7,200 lbs. chemicals 1,300 kWh	\$13,200	Proposed
Lean Layout with Conveyors	260	---	\$7,100	Proposed
Implement Supermarkets	50	---	\$1,400	Proposed