Linamar Corporation
SkyJack Paint NCR Shelf

May 2023-August 2023

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1. Problem

Figure 1: Disorganized NCR bin jeopardizing safety and damage of parts

A huge challenge at Skyjack Plant 1 included the management of Non-Conformance Reports (NCRs). Particularly, the daily influx of NCR'd parts has created strain on material handlers, Quality Engineers (QEs), supervisors, and NCR coordinators. When backlogs of NCR's occur often, parts usually become disorganized, lost, or damaged. The physical space constraints on the floor and in the yard add further complications. Additionally, prolonged retention of NCR parts may result in obsolescence. The current workload on the Material Review Board (MRB) team has led to communication gaps, increasing the risk of mishandling and loss of parts. Obsolescence, lost, damaged, or disorganized parts cost the plant huge deficits in cost, as well as jeopardizes the safety of workers interacting with the Paint NCR station.

2. Solution with Model

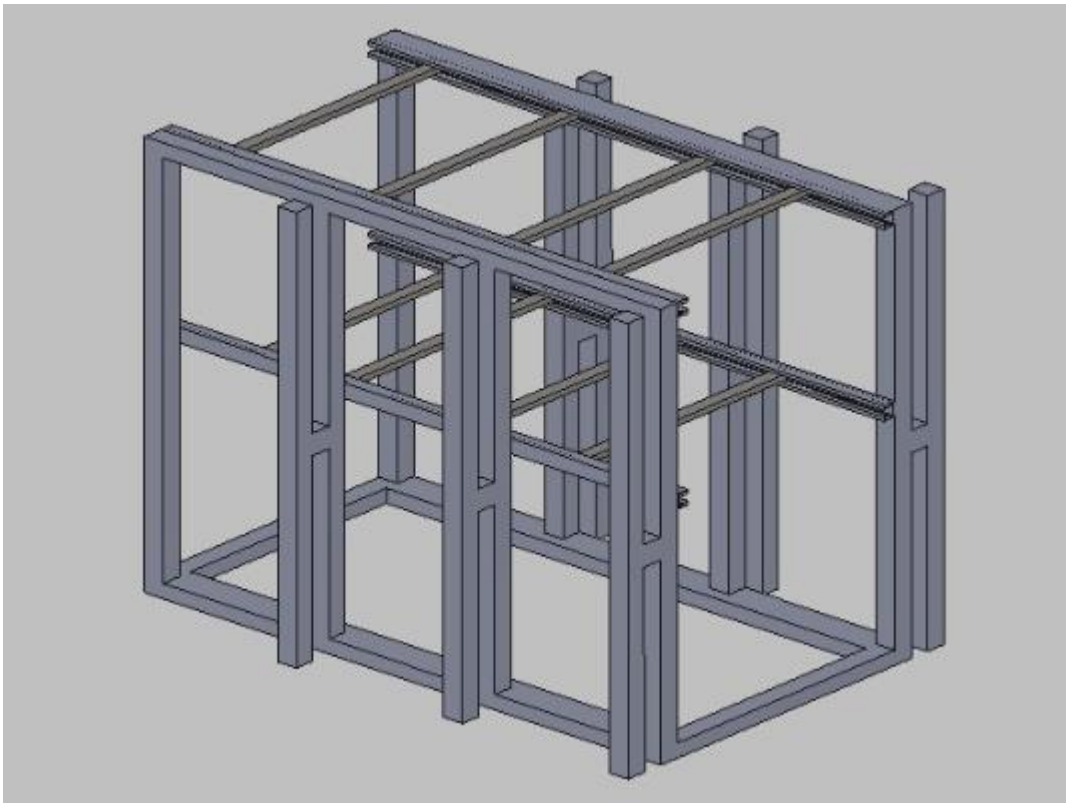

Figure 2: Isometric view of the ergonomic shelf, including sliding cross arms for variable sizing parts

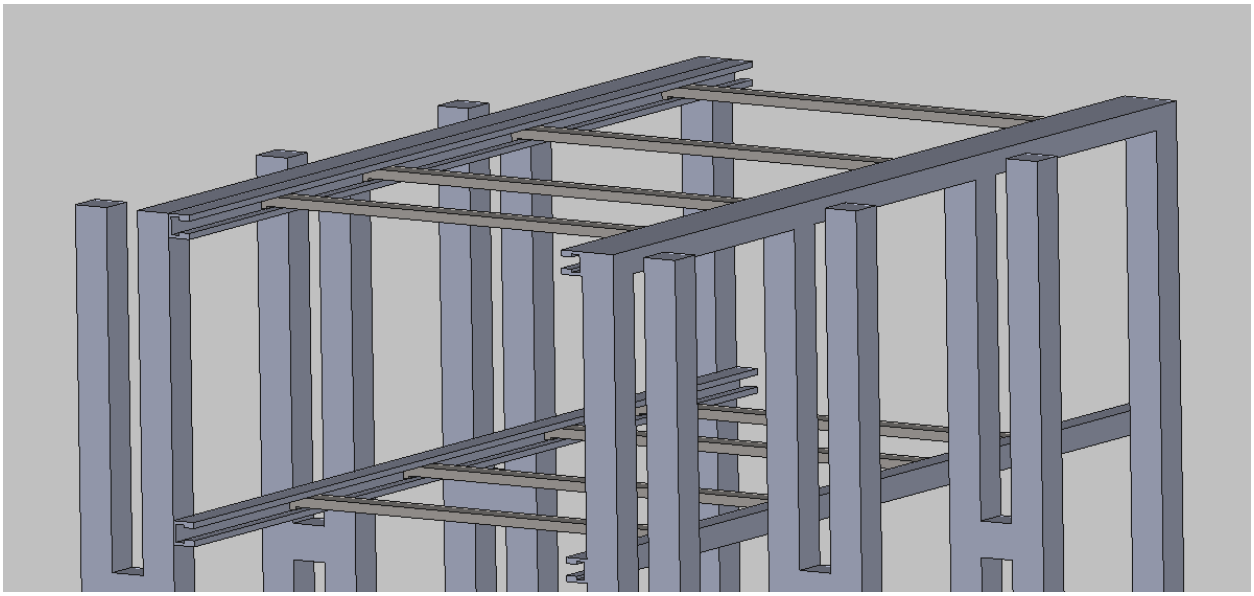

Figure 3: Top view of the ergonomic shelf, including side slots for vertical placement of NCR arms

A new shelf design was developed, utilizing SolidWorks, improving the organization of Paint NCR's, improving ergonomics, safety, and cost mitigation for damaged parts. Each cross arm can slide throughout the structure to adjust for any size of equipment. The maximum sizes of equipment was accounted for in the final dimensions. Along the sides of the shelf, specific NCR arms can be hung to make space as efficient as possible, as well as ease of access to parts as easy as possible.

3. Design Considerations

3.1 Structural Analysis

A comprehensive structural analysis was undertaken to ensure the harmonious integration of design elements, materials, and manufacturing processes, thereby upholding a robust and well-balanced structure.

3.2 Economics

Cost-saving analyses and payback periods were calculated and performance metrics were presented, leveraging insights from historical data related to paint NCR.

3.3 Safety and Ergonomics

Thorough safety and ergonomics research was conducted to ensure the well-being of workers who interact with the shelf, whether they are walking past it or engaging in the process of placing or removing components, were safe.

3.4 Materials and Manufacturing

Extensive research on materials and manufacturing processes was conducted to address cost considerations, all while upholding structural integrity and ensuring a seamless transition throughout the entire design-to-shelf creation process.