

# RAIL PRODUCTS MANUFACTURING EXPERIENCE CASE |

## Ramping Up Production & Maintenance, Procurement Controls, and Sustainability



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Next Stop:  
A Stronger, More Efficient Organization

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## EXPERIENCE CASE | Rail Products Manufacturing

Ramping Up Production & Maintenance, Procurement Controls, and Sustainability

### Becoming a Stronger Supplier and Employer

A leading manufacturer of tank and freight railcar components rightfully expected continuous improvement in their Rail Products Group business segment. The team's products play a crucial role in the North American supply chain by providing customers with the means to transport bulk commodities and goods by rail. Their end customers (firms in agriculture, energy, chemicals, construction, and consumer products) continue to lead the charge in deploying an economical, sustainable, land-based transportation option within their supply chains.

Offering hundreds of customized rail product designs and configurations to support their industrial customer base, product development requirements were moving faster than the established component supply chain and production capacity could handle. The firm's in-house team had several lean initiatives underway. While these initiatives were paying off with very respectable increases in production deliveries, they needed to accelerate the pace of the manufacturing cycle much faster than the pace of internal progress. Not only did the team need to shorten the production cycle, their annual production deliver goals had increased by 15%; so, they needed to get more products out in total, too.

The in-house team was well-versed in lean practices and already embraced continuous improvement principles. However, they did not have the day-to-day breathing room to redesign the entire order-to-deliver process. The current process was at least ten years old. They made incremental improvements in particular product groups and contributing departments, but did not have the time or the resources to evaluate the entire process. That's why our collaboration was developed. This engagement provided the chance to look at all processes, poke at assumed best practices, and exhaustively scrutinize standard procedures.

### Working with Management and Employees

After several working sessions to understand exactly what the firm wanted to accomplish, the timeline expectations, and the level of support required of our subject matter experts (SMEs), we collectively developed an initial project approach with a highly-detailed key event schedule (KES), incorporated more in-house talent into the project roadmap, and secured workstream leaders in these areas:

- Executive Management Steering and Oversight
- Operations
- Maintenance
- Procurement
- Information Technology
- Human Resources
- Finance
- Shipping Yard



### Rail Products Manufacturing

#### Case Synopsis

- Increased production efficiencies, optimized maintenance, stronger cost controls, and better management & supervisory training in a rail products & services company

#### Client Profile

- \$500+ million revenues
- 2,000+ employees
- 60+ years in business

#### Engagement Results

- 5.2 to 1 ROI

#### Operational Benefits

- 15% improvement in Production efficiency
- 14% reduction in work-in-process
- 25% improvement in work order schedule attainment
- Optimized maintenance management
- Efficient quality control processes
- Stronger procurement process controls
- Implemented timely operating reports
- More advanced continuous improvement teams

#### Organizational Benefits

- Reduced stress due to overtime
- Designated and developed procurement categories
- Better data analysis and reporting capabilities
- Shared project management, procurement, and maintenance best practices with internal team

#### Financial Benefits

- 34% reduction in overtime
- 15% reduction in indirect materials spend
- 14% reduction in energy costs
- 14% more working capital freed up for higher priority usage



## Operational & Organizational Improvement Areas

Working with Firm Management, Workstream Leaders, and a team of SMEs across 21 weeks, several key process and systems components were developed and implemented including:

**1 | Manufacturing Process Controls**—Created manufacturing controls including upper control limit / lower control limit charts to reinforce process stability and machine centerlining set-ups. We worked with Management to develop a comprehensive root cause analysis / problem-solving system (across Production, Weld Management, Quality Finds, and Safety) including pareto analysis, constraint reason code development, and 6S visuals (such as tool shadow boards, work-in-process kanban system, and machine setting and changeover procedures in one-point lesson reference books out on the floor). Production scheduling incorporated a stronger, cross-departmental planning meeting and introduced a customized capacity planning model with updated work-to-time standards.

The teams spent time in kaizen events improving order-to-shipping workflow, establishing baselines, and isolating process constraints. Additionally, digital scoreboards were placed at shift handover sites after being developed from scratch by modeling data flow and visual representations using Microsoft Excel files. After new process controls were developed, tested, and refined, the team created a digital repository of all new process flows along with easy-to update standard operating procedures to further process control training and get new-hires acclimated to the next-level manufacturing intricacies. Finally, a sustainability compliance checklist was created to reinforce continuous improvement in a controlled, strategic manner.

**2 | Data Management and Reporting Effectiveness**—The aforementioned digital scoreboards effectively showcased the interdependencies of Production, Maintenance, Production Scheduling, and Shipping by incorporating operations-based data (productivity, efficiency, quality, schedule attainment, etc.) rolled up from each shift into weekly reporting across all locations.

One of the more glaring reporting gaps was in Maintenance. This crucial component needed more work capacity visibility, better employee performance management, and more impactful metrics correlating with equipment uptime. So, the team developed Work Order Management reporting (metrics now measuring uptime, critical equipment tagging & monitoring, preventative maintenance, planned work, unplanned work tracking, etc.

All departments across all locations now have shift-level operating reports flowing into monthly roll-up reports. In an unprecedented change, Procurement developed their own key metrics battery and digital scoreboard (including non-conformance reporting, energy usage trend analysis, inventory tracking, and category spend plan vs. actual signals).

**3 | Capacity Planning and Crew Balancing**—This engagement allowed the team to build a pragmatic capacity planning model from the ground up using updated work-to-time relationships now established. With regard to production lines, equipment standards and preventative maintenance downtime, schedules were updated to reflect new-found production capacity. The updated capacity planning model was instrumental to cutting down unnecessary overtime. The crews liked some overtime but were feeling overworked with excessive amounts. Better planning and production constraint removal helped curtail overtime.



Catalyft Team's Collective  
Manufacturing Engagements:

**\$450 Million**  
Manufacturing Client  
Revenue Size  
(Historical Avg.)

**5**  
Workstreams Per Engagement  
(Historical Average)

**15+**  
Manufacturing Sub-Sectors  
Covered  
(Total)

**70%**  
Manufacturing Engagements  
with Supply Chain Component  
(Historical Average)

**4.0 to 1**  
Manufacturing Return On  
Investment  
(Historical Average)



**4 | Procurement Spending Controls**—The team applied an impressive focus in not only creating precise spend analysis snapshots and trend-lines by key categories but also connecting the data sources to a new Procurement dashboard. Using 6S principles (sort, set in order, shine, standardize, sustain, safety), the team developed personal protective equipment (PPE) and maintenance, repair, and operations (MRO) controls at critical storeroom inventory control points. Furthermore, the Procurement department received intensive training on best practices and techniques including negotiation principles, supplier relationship management, enterprise resource planning (ERP) systems navigation, and financial & operational data analysis.

Furthermore, Procurement was involved with building a “make vs. buy” model to allow the team to find products where it was more cost-effective to make what they were currently purchasing from vendors.

**5 | Management Decision-Making**—One of the most powerful exercises occurred during cross-departmental training sessions when Procurement’s decisions were traced to impacts on Production, and vice versa. This became a chance to see the repercussions of insular decision-making on other departments and the extra work unwittingly passed over to colleagues. The team received training on newly-developed decision-making tools such as operating report analysis guidelines, new planning & scheduling metrics trend analysis, capacity planning modeling with work-to-time relationships across departments, and traced the flow of operational performance into the company’s financial statements. Additionally, the team walked through updated standard operating procedures (SOP) and new process workflows.

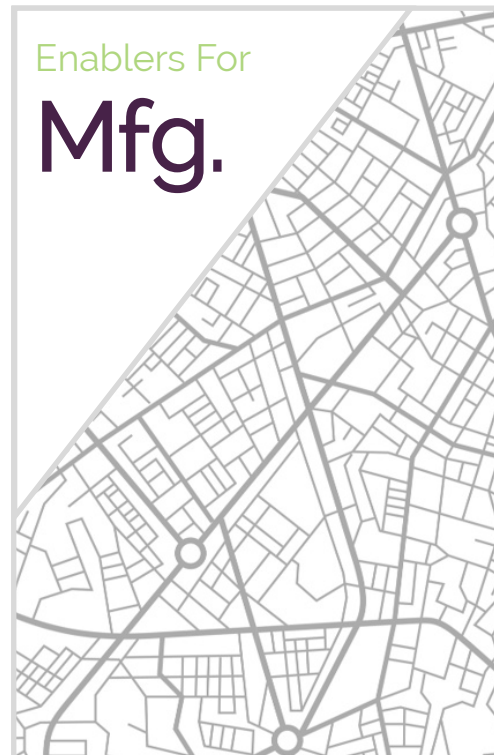
**6 | Management and Supervisor Skills**—Management training also included on-the-floor supervisory training incorporating typical coaching scenarios for Production and Maintenance (shift handovers, on-the-floor support behaviors, equipment changeovers, work order completion, quality control checks, and weekly production reviews). The team also coordinated original equipment manufacturer (OEM) overviews for critical production equipment. For the Procurement team, all staff took part in negotiation training with a heavy emphasis on going through uncomfortable conversations with role-playing scenarios. Finally, the team developed an updated onboarding pack and training materials for future employees to get them up to speed on new systems, controls, and processes. Finally, all employee-facing signage and training materials were created in English and Spanish—the two most prominent languages in these Western U.S. locations.

**7 | Energy Savings Controls and Processes**—Given the growing production input costs and pricing variability of natural gas and electricity, the team focused on finding ways to control and precisely monitor energy usage. Initially, the team started finding energy savings buckets through voltage checks on key motors to make sure current consumption was within accepted parameters. They also checked for air compressor and vacuum leaks. Next, the team made some key changes to equipment run times by scheduling during non-peak (less expensive) hours. They revamped the equipment maintenance program with energy draw-down parameters, now better understood, and optimized heating and cooling settings schedules throughout the year. Production start-up and shut-down protocols were also updated to incorporate more energy-saving steps without sacrificing performance.

The team also made some changes that did take some initial expenditure to save on energy in the long run. Some examples included investing in more efficient light-emitting diode (LED) lighting and purchasing



## Enablers For Mfg.



### Team Performance Enablers:

- Customer-oriented focus and Employee-centered implementations
- Data analytics and visualization timeliness and usability
- 6S program and lean processes
- Strong Project Management Office (PMO) and Knowledge Management System (KMS)
- Collaborative Employee communication and engagement
- Equipment calibration and changeover time reduction
- Overall Equipment Effectiveness (OEE) management
- Enhanced Sales & Operations Planning (S&OP) integration
- Technology paired with practical processes
- Production and Maintenance integration
- Pragmatic training and onboarding programs





timed sensors to turn off lighting when not in use.

Crucial to the energy savings component, the team developed ways to make energy usage more visible. Some pathways leading the organization to a greater appreciation of energy usage and costs included developing consumption baselines and targets for natural gas and other energy supplies, tracking energy performance on the team's new operating reports, and providing some training material for Production and Maintenance that supported understanding the repercussions of excessive energy usage and ways their own decision-making made an impact on consumption.

**8 | Sustainability & Continuous Improvement**—Additional developments by the team included a reconfigured, more efficiently flowing, and safe yard layout in one location, improved inventory management tracking, and more advanced coaching for the Supervisors and Work Leads after the tools and processes were further refined. As the engagement progressed, the team developed a digital repository called the Center of Excellence where all procedures, process flows, data sources, and examples of control tools were stored. Finally, a comprehensive sustainability audit was created at the behest of Management, Supervisors, and Work Leads that provided a summary of all the new tools, processes, and procedures along with an agreed process to make changes to any of the adopted system elements as the organization continued to grow.

## The Results

After 21 weeks of applying our collective improvement expertise and manufacturing experiences, the firm delivered a 15% improvement in production efficiency, 14% reduction in work-in-process, 25% improvement in work order schedule attainment, improved production processes & standard operating procedures, more optimized maintenance management, more robust quality control processes, stronger procurement process controls, more comprehensive and timely operating reports, and a much more advanced in-house continuous improvement team to generate additional gains and manage systems iterations.

Valuing the collective operational and organizational benefits in total, this collaboration delivered a 5.2 to 1 return on investment (ROI).

## BEST PRACTICES SERIES



## PROCUREMENT

- Strategic sourcing with risk mitigation plans
- Collaborative Supplier Relationship Management (SRM)
- Category spend analysis and management
- Increased cross-functional internal collaboration and decision-making across departments
- Process digitalization—greater use of automation technology and cloud-based applications
- Supplier Scorecards with dedicated Share & Review meetings
- Contracts analysis and management
- Product performance data sharing
- Robust supplier communication
- Procurement-centered negotiation, data analysis, and technology training
- Procurement talent management
- Stock-keeping unit (SKU) rationalization process
- "Make vs. Buy" and "Should Cost" models
- Environmental, Social, and Governance (ESG) principles embedded into supply chain
- Feasible shared services and outsourcing programs
- Built-in continuous improvement process for Procurement

