

BRUNSWICK CORPORATION - MERCURY MARINE

Moving From Infinite To Finite Capacity Planning

Student Team:

Jian-Liang Lin – Master of Business Administration
 Jack Simmons – Dual MBA & MSE in Industrial and Operations Engineering
 Xinran (Sharon) Sun – EGL (BSE & MSE in Industrial and Operations Engineering)

Project Sponsors:

John Buelow – VP of Global Operations
 John Cavey – Director of Global SLOP

Faculty Advisors:

Oleg Gusikhin – College of Engineering
 Jim Omartian – Ross School of Business

Mercury Marine, a subsidiary of **Brunswick Corporation**, is a \$3B manufacturing leader in the recreational marine boating market. They produce both engines and marine parts and accessories. The Controls & Rigging (C&R) division falls under Mercury's Propulsion department and is a \$300M business. C&R products are high margin and include switches, steering, GPS systems, Speed Display, joysticks, engine controls, and wire harnesses that connect steering controls to the engine.

Mercury's C&R business used an unconstrained production scheduling system that functioned well when the business was right sized. However, during COVID-19, Mercury saw huge demand spikes in recreational boating. Forecasters did not predict the demand would last beyond 2022, so Mercury decided to maintain its current manufacturing footprint. It did not approve capital expenditures for facilities but did approve spending for short term capacity increase within its existing infrastructure. Despite efforts to restructure plant layouts and add headcount to existing lines, Mercury was holding a backlog 10x their previous high. In addition to the underlying capacity issue, supplier shortages were exacerbating back orders by extending lead times from weeks to months. From a plant level view, schedulers were required to make manual changes to the system-generated schedule to smooth out the fluctuating demand signals into executable production levels. Plant floor personnel in one of Mercury's C&R departments were manually moving over \$600,000 of product orders a day in 2021.

To combat these issues, the Tauber team mapped the process flow of C&R plants, interviewed stakeholders about the impact of demand changes on the S&OP process, analyzed data to narrow down the focus area, and piloted a solution. The Tauber team created a capacity constrained scheduling model with an 8-week firm horizon. It translated last minute changes and demand spikes into a predictable, efficient, and executable production schedule for the plant. The pilot resulted in 6 consecutive weeks of consistent, above average output, the longest streak of consistent production in 2021. It decreased the need for manual schedule intervention by over 84%. On-time delivery increased by 18% in just 4 weeks.

Following the success of the pilot, Mercury plans to roll out the Tauber team's solution to the entire global Controls & Rigging department with potential applications in the Parts and Accessories business. This is expected to deliver a cost savings of \$42M by Year 3, with a potential upside of \$62M from increased service levels, reduced transportation costs, increased asset utilization, and increased plant output.