THE BOEING COMPANY

Optimizing 777X Wing Recovery Planning for On-Time Delivery

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Boeing is the world's leading manufacturer of commercial airplanes. The 777X, Boeing's newest twin-aisle airplane, is a key part of the company's strategy to maintain market leadership in commercial wide body aircraft manufacturing. Expected to enter service in 2020, the 777X advanced design includes all-new composite wings and engines. As a result of these design changes, the 777X promises to deliver 10% greater fuel efficiency and a 12% reduction in operating costs over the competition, making it the world's largest and most efficient twin engine airplane.

Preparing to manufacture the 777X has presented many new challenges for Boeing. The 777X's wings are larger than any other commercial airplane wing, and they are fabricated using carbon fiber composites – materials that require an entirely new fabrication process. During low rate initial production, schedule disruptions were occurring frequently for a variety of reasons, including machine breakdowns, defects, construction, and labor loss. As Boeing prepared for full rate production, the Composite Wing Center (CWC) needed to strengthen its ability to respond quickly to unexpected delays with a recovery planning process that minimized costs and reduced the risk of missing a delivery.

After observing current state scheduling practices for 777X wings, evaluating practices at five other fabrication and assembly sites, and interviewing more than 30 engineers, operators, managers, and subject matter experts, the Tauber team conducted a thorough root cause analysis to determine why the CWC was not responding more efficiently to schedule disruptions. As a result of this analysis, the Tauber team developed a dynamic recovery planning tool to efficiently assess and display the downstream impact of disruptions and prioritize processes based on the Theory of Constraints.

With the Tauber team's tool, engineers can easily view the current status, resource constraints, and precedence networks of thousands of production processes; monitor shared asset utilization; and quickly generate optimal minute-by-minute recovery plans. To transition the tool to Boeing, the Tauber team trained engineers to develop recovery plans and prioritize shared assets using the tool and modify the tool's underlying logic as production scales up and processes change. After fully implementing the tool, the CWC will produce more optimal recovery plans 43% faster, resulting in less overtime, improved asset utilization, and reduced risk of missed deliveries.