

Look ahead, stay **Lean**

BCA's Skin & Spar team finds way to support simultaneous needs of 2 new-airplane programs

By JEFF WOOD AND ROBIN MCBRIDE

Around this time last year, Boeing Fabrication ran into a big challenge to its Lean operations: finding a way to support two new-product development programs whose requirements overlapped one another on the calendar.

The Skin & Spar team members in Frederickson, Wash., faced a host of issues related to double booking their complex manufacturing resources. The schedule for Skin & Spar, a Fabrication manufacturing business unit of Commercial Airplanes, required the team to begin fabrication of wing parts for the first 777 Freighter during early 2008. At the same time, the unit was scheduled to build key wing components for the first P-8A Poseidon, a new military derivative of the Next-Generation 737-800 that Integrated Defense Systems will deliver to the U.S. Navy in 2009.

Trying to juggle multiple manufacturing requirements in one factory can be difficult, especially when the Fab team's goal is to remain Lean. Skin & Spar's solution came through development of a "build ahead" plan that would avoid overlap and risks of missed deliveries to its Airplane Programs customers.

By working together with Engineering, Skin & Spar would complete much of its 777 Freighter work before beginning P-8A production. To enable the plan, Engineering provided early release of drawings and models of wing-box stringers, wing-skin panels, channel-vent stringers, spar chords and webs.

"There was a lot of synergy between manufacturing and program engineers working together," said John Donohue, 777 Freighter project leader. "In the process, the team found a way to use the same production engineering, planning and numerical programming concepts for both the 777 Freighter and P-8A programs. They can be

proud of the efficiencies they developed, including a new, flexible manufacturing plan that now can be passed on to help the 747-8 Program."

To coordinate project information, visual cues with "need dates" showed team members every requirement from raw material procurement to fabrication and acceptance. In addition, supply-chain management analysts released to suppliers material transfer and production orders several months ahead of normal lead time.

Regularly communicating the build-ahead plan across the organization became critical, so a cross-functional team met weekly to adjust plans whenever unexpected developments emerged.

"The flexibility of our team and the shared understanding of our plan allowed us all to focus on solving problems together. That was key to our success," said Verna Warrick, production engineering representative.

Ensuring that parts were completed on time wasn't the team's only challenge, however. Finding room to put the finished parts was, literally, the biggest issue.

In 2003, Skin & Spar implemented a just-in-time production system. Normally, completed wing parts are kitted in racks or loaded directly into transportation modules for shipping and delivery just days before they're needed at factories in Everett and

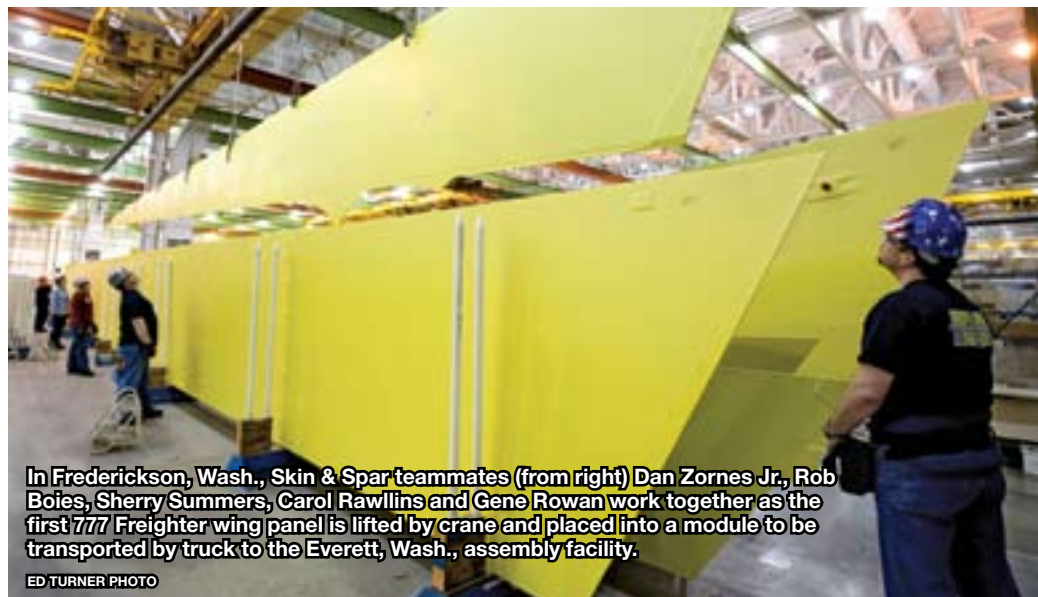
Renton, Wash. But that meant Skin & Spar didn't have the room to store the hundreds of huge "sleeping" parts measuring some 97 feet (30 meters) long and weighing up to 1,500 pounds (680 kilograms).

The team's storage solution for 777 wing panels was to use temporary racks and transportation modules previously dedicated for 747 wing panels. For wing stringers, the team elected to bundle them in their fabrication cradles until they could be transferred into racks for shipment. For temporary storage of channel vents, the team used cure racks that minimize handling and preserve the high quality of the components.

By the second week of February, the team's creative problem-solving paid off, when the first wing components were delivered to Everett—just in time to take their place on the 777 Freighter assembly line.

"Despite growing production requirements and resource challenges, we worked together as a team and implemented a plan to support critical new product development," said Robin Carsten, Skin & Spar, kitting, delivery and tooling manager. "And we did it without impacting daily delivery commitments to our customers. Each and every day, I am truly amazed at how this team finds a way." ■

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In Frederickson, Wash., Skin & Spar teammates (from right) Dan Zornes Jr., Rob Boies, Sherry Summers, Carol Rawlins and Gene Rowan work together as the first 777 Freighter wing panel is lifted by crane and placed into a module to be transported by truck to the Everett, Wash., assembly facility.

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