

# Encore performance

Teams designing the 747-8 passenger plane used discipline, lessons learned—and a proven tool to keep the program on track

By Dawsalee Griffin

Sometimes what it takes to do a new job right is an old, simple idea: discipline.

Nyle Miyamoto, Anthony Slama and Steve Brown proved that after they joined the 747 program. Miyamoto and Brown came in February 2008 and Slama in January 2006. Design work on the initial freighter version was behind schedule. Morale was low. Overtime was mandatory.

And the follow-on 747-8 Intercontinental model—the re-envisioned passenger version of the venerable “Queen of the Skies”—could easily have fallen victim to many of the same problems.

Instead, the Intercontinental has met every weekly design deadline for more than a year and a half. Teams pitch in and help one another at any hint of trouble. Morale is high.

“There was a lot of churn on the 747-8 Freighter program,” said Brian Thorpe, 747 airframe engineering manager, who defined churn as the extra work caused by late design changes and the lack of agreed-to standard processes. “We knew we needed to do the process differently for the Intercontinental.”

Miyamoto and Brown came from



the original 767 Tanker program, where Brown had been developing standardized processes and templates that he brought with him to the 747-8. Executives from the 737 and P-8A programs brought lessons learned and a tool developed years ago by the Boeing site in Wichita, Kan., to keep design work on track and running smoothly—the non-recurring

product development tool. Called NRPD for short, the tool uses Excel-based tracking to provide milestone metrics and trend data.

Engineers and managers who had used the tool liked it and had taken NRPD with them as they moved on to new projects. From Wichita, it migrated to the P-8A, the 737-900ER (Extended Range)

**PHOTO:** Mechanics at the Everett, Wash., factory load the Section 41 cab into place for the first 747-8 Intercontinental. This is the area of the fuselage that houses the flight deck on the upper deck and the forward passenger cabin on the main deck.

JEREMIAH SCOTT/BOEING; GRAPHICS: DOUG YAMADA/BOEING





**PHOTOS: (From left)** Tony Slama, Kurt Madsen (center) and Steve Brown hang a wind sock signaling that the airframe design team met another weekly design goal. By the time the team finished its work in June, 76 wind socks lined the hallway—indicating the team had performed 100 percent on time since the beginning of the project. **ED TURNER/BOEING** Mechanics perform inspections before joining the cab to the rest of the 747-8 Intercontinental's Section 41 structure. **JEREMIAH SCOTT/BOEING** Some of the 747-8 engineering leads who helped keep the project on track (from left): Matt Wilson, Jim Wilkinson, Paul Koehler, Brian Gregg, Ashish Patel, Kurt Madsen and Dave Haworth. **ED TURNER/BOEING** 747 mechanics prepare to lift the cab into position to join it to the Section 41 bottom section. **JEREMIAH SCOTT/BOEING**

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and the 747-8 development programs. Now it's being used by the 787-9 and NewGen Tanker projects.

The Intercontinental team not only adopted the tool but also expanded its use. NRPD was used to track the entire project.

“It allowed everyone to know exactly, day by day, step by step, what was supposed to happen, who the step owner was and what the status was, and to predict future performance,” said Slama, a lead in the 747 Program Planning & Control group at the time.

Miyamoto, then a 747 engineering manager, Brown, then a 747 engineering lead, and Slama proposed a framework for design efforts on the Intercontinental using a disciplined approach, an integrated plan and improved tools.

Their goals were straightforward—eliminate as much rework as possible, standardize processes and templates,

use better tools to track progress, and ensure effective communication among the worldwide design team.

“Everyone had to agree,” Miyamoto said. “We wanted a commitment from everyone—from the employees on the floor to the program leaders—that they would follow the plan and processes.”

The commonality of the two airplanes made it easier to define the basic requirements for the passenger version, which followed the freighter. The wing was essentially the same; the basic fuselage configuration required only minor changes for the passenger version; and the definition of the loads, or stresses the airplane needed to withstand, was complete.

“We focused upfront on defining the configuration,” said Brian Gregg, 747 lead structures analyst. “We were able to build on the experiences from the freighter and do a better job of planning what we needed to do.”

Layouts—electronic blueprints showing all systems interfaces in a specific section—were integral to defining the work that needed to be done.

“We used a more disciplined process to control the statement of work, including using layouts to develop the statement of work and discover potential problems,” said Dave Haworth, 747 design lead.

To stay on top of the schedule, as well as to provide metrics and status of each of the drawings, the team used the NRPD tool.

Standardizing processes also was a factor in successfully meeting the Intercontinental's aggressive design schedule. As a result, detailed design work done for the Intercontinental by Boeing Defense, Space & Security engineers in Long Beach, Calif., looked exactly like the work done by engineers in Everett, Wash. This made handoffs to other engineers

or to suppliers easier. Experienced people made a difference, too.

Because work was going more smoothly than it had on the freighter, the leads also had more time to match assignments and skill levels. “We still worked with a worldwide design team,” said Ashish Patel, 747 stress engineer, “but the work was better distributed with the more demanding work going to those who had the appropriate skills.”

The result? By the time the 747-8 Intercontinental airframe group had completed the design work in June, it had gone 76 weeks without missing a weekly deadline.

Today, employees from the Intercontinental design program are sharing their experiences on other programs throughout Boeing. “Moving people around is a way of sharing information and best practices dynamically,” said Mo Yahyavi, vice president and general manager of the 747 Program.

Indeed, Miyamoto now is a senior manager in product development. Brown and Slama are both working on the 787-9 design effort. And all three are still spreading the word, helping ensure Boeing programs everywhere capitalize on the Intercontinental success story—by design. ■

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