

Houston, we have a need



INDYNE PHOTO BY KEVIN GILL

Clay Stangle, shown at the Space Station Processing Facility at Kennedy Space Center, Fla., is a design engineer on the International Space Station program. But he's also working on the wire design for general lighting systems for the 787.

Space Exploration engineers pitch in on programs around IDS and BCA

By Ed MEMI

If you know Boeing well, you probably associate work done by Houston employees with space-related programs. Yet Houston-based engineers in the Space Exploration business unit lately have been busy helping Boeing and its suppliers on several Boeing Commercial Airplanes and Integrated Defense Systems programs.

The work, permitted under Interorganizational Work Authorization (IWA) arrangements, allows different business units within the company to help one another and work together as a larger

team. For Houston engineers, this work broadens their experience and skills. And for Boeing, the arrangements do more than help with workload lulls in the International Space Station and Space Shuttle programs: They improve retention of people with important abilities—and they support Boeing's efforts to better integrate the company's business units and enterprisewide functions.

"Just in the last year, BCA and IDS have really started to come together and realize that they have resources that each can share," said Charles (Clay) Stangle, a design engineer on the ISS who now works on the wire design for general lighting systems for the 787. "I feel now that I am well prepared to support the commercial side, and I am able to support the ISS when they need me. It is the best of both worlds for me, since I enjoy both jobs."

Here's a look at some of the work being done by these engineers.

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Mark Santen, manager of Mechanical, Structural, Thermal and Propulsion engineering for Space Exploration, led efforts to get about 45 team members working on the 787 and P-8A Poseidon programs. The P-8A is a U.S. Navy maritime patrol and antisubmarine aircraft based on the Next-Generation 737-800 airframe.

Santen's team is handling instrumentation installation drawings for five P-8A test aircraft. The work consists of creating drawings that ensure that certain sensors, which provide data during flight and ground tests, are installed in the right place on the aircraft. The analyzed data will be used to flight-certify the P-8A for the Navy.

"We had experienced designers available in a Boeing common-mechanical-design software, so we offered up four people initially, which has since grown to about 15," Santen said. The P-8A program, Santen said, decided they wanted their entire design team in Seattle, including the Houston engineers.

One of the achievements on the P-8A program is first-pass quality in Test & Evaluation engineering drawing releases. "We had 34 engineering drawing releases on P-8A with no rejections from BCA," Santen said. "The program has built a drawing quality step into the T&E process that guarantees acceptance, which eliminated cost and schedule delays caused by rework."

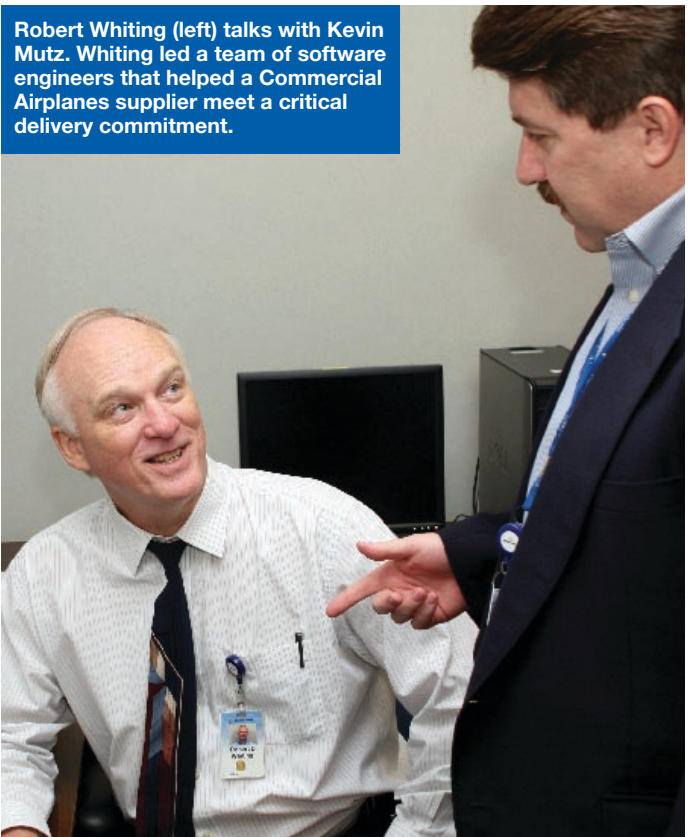
Meanwhile, for the 787 program, Santen's Space Exploration teammates are assisting on mechanical and structural design for interior items. These objects include passenger service units, flight attendant seats, environmental control systems, and general lighting systems. Santen said he expects the 787 work to continue into 2008 and hopes to help out on other BCA programs.

While the work provides the 787 with additional manpow-



Mark Santen, manager of Mechanical, Structural, Thermal and Propulsion engineering for the Space Exploration business unit, has had team members contribute to the 787 and P-8A Poseidon programs.

PATRICK ARMSTRONG PHOTO



Robert Whiting (left) talks with Kevin Mutz. Whiting led a team of software engineers that helped a Commercial Airplanes supplier meet a critical delivery commitment.

er, there's something in it for the engineers. "Our engineers are learning model-based design so that everyone is using the same electronic version of the design. This is the wave of the future in the design world, and BCA is already there," Santen said. Boeing Houston engineers are now gaining that expertise to compete for future NASA business.

In addition to this support of the 787 and P-8A programs, Santen said his team is looking for ways to help the Boeing Space and Intelligence Systems business unit in El Segundo, Calif. "We are helping them on various satellite programs, including thermal analysis and thermal/vacuum testing support, loads and dynamics, and antenna test requirements development," he said.

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The Houston software group has had about five people handling IWA work. The software group helped with testing on a new tire pressure and brake temperature monitoring system on the 777 for Boeing supplier Crane Aerospace & Electronics. This new monitoring system provided additional savings in cost and weight, along with improved reliability, compared with the original system.

When the ISS and Space Shuttle software teams were faced with future downsizing, Kevin Mutz, senior software manager in Houston, contacted Jim Hicks, his former mentor and the chief engineer for 747/767/777 Systems. Within a week, a team of software engineers was at Crane's facility in Lynnwood, Wash.

"The team, led by Robert Whiting, was able to get up to speed quickly and help the Crane team meet their critical delivery commitment," Mutz said. "The key to success was a dedicated, diverse team made up of a core of engineers with past commercial airplane experience and others with diverse software backgrounds.



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Houston-based engineers are pitching in on programs around Boeing such as the P-8A Poseidon, a U.S. Navy maritime patrol and antisubmarine aircraft based on the 737-800 airframe.

The team’s work scope and size grew quickly as Crane’s leadership team recognized the talent and capabilities of the team. Not only did this opportunity help our BCA colleagues, it helped us retain valuable ISS and Space Shuttle employees.”

Crane was able to meet the critical dates for delivery of the Tire and Brake Temperature Monitoring System to Boeing.

“None of this would have been possible without the tremendous support from the Boeing team. The team came up to speed in record time and worked extremely hard to achieve some challenging milestones,” said John Edgar, Crane Aerospace & Electronics software director.

In addition to the 777 work, the Houston software team currently has three people helping Crane handle requirements, design, code and test for the 787. “They like the fact that we have a very talented engineering team, past experience on commercial airplanes, reasonable rates, and a proven track record,” Mutz said.

Another plus for the team: Because the software group has the highest Capability Maturity Model Integration rating, the team is very process-oriented (CMMI is an industry-recognized framework that provides insight to the ability of a company to execute on proposed projects). “Our capabilities in terms of CMMI as well as our capabilities to do the whole life cycle from requirements to test to full software quality assurance, safety and config-

uration management is something not all software companies can do,” said Mark A. Ward, manager of Software Engineering and Guidance, Navigation and Control Systems and a software functional for Space Exploration.

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Another Houston team helping on the 787 program is a crew of electromagnetic effects engineers. Kreg L. Rice, ISS specialty engineering manager, said he has two such engineers working on 787 qualification test plans and reports. Electromagnetic Interference testing ensures the electronics do not interfere with one another. Rice said, “Our work helps us gain recognition across the company, and BCA actually extended our period of performance through April 2008. It is interesting work in that we get to work with a lot of different electronic suppliers for Boeing.”

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Although IWA work offers benefits, it’s not without its challenges. Among them: the duration of the work. “A lot of the work is short-term and urgent, making it difficult to predict and a challenge to integrate with the long-term staffing plans,” Mutz said.

Yet those who oversee this work said it helps in a critical area: Retaining people with important skills.

“From the data we have, people leave because they are interested in new work and want career growth,” Santen said. “If they were doing the same work for a long time and it is not expected to change dramatically, they may feel locked in a position that is not growing them. IWA is interesting work where they can grow and learn new things.”

“Everything moves at a much faster pace” with work on the 787, said ISS design engineer Stangle, who’s contributing on the 787 program. “The coolest part of doing the wire designs for the lights is that my designs will be on every 787 that Boeing sells and produces. That’s a neat feeling.” ■

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It’s our future

Actions cited in this story show how employees are applying concepts of the Boeing Management Model to support the company’s business strategies. Here’s how.

- **Growth and productivity: Lean+, through cross-enterprise integration that also offers career-development opportunities and helps retain employees who have important skills.**

To learn more about the Management Model, visit <http://bmm.web.boeing.com> on the Boeing intranet.