BOEING

Frontiers

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JUNE 2012 / Volume XI, Issue II

SHARING THE DREAM

Boeing South Carolina employees celebrate their first 787 rollout

Ad watch

The stories behind the ads in this issue of *Frontiers*.

Inside cover:

Last month, Boeing announced the launch of Milestones in Innovation, its first official iPad app available for free from the App Store. The app brings nine decades of aviation innovation to life through beautiful still and video imagery and an interactive timeline.

Page 6:

This year marks the centennial of Marine Corps aviation. This ad was created to recognize Marine Corps aviation for helping protect freedom around the world and highlights Boeing's contributions to this milestone. The ad appeared in *The Washington Post* and key military and congressional publications.

Page 42:

This ad celebrates the Boeing 787 Dreamliner's win of the Robert J. Collier Trophy, one of the aerospace industry's most prestigious honors. The award places the Dreamliner in an exclusive group of pioneers that revolutionized aeronautics and astronautics, such as Orville Wright, Chuck Yeager, the 747 and the V-22 tilt-rotor aircraft. The ad ran last month in *Aviation Week*.

Page 44:

This ad shows Boeing's appreciation for and gratitude to the U.S. Armed Forces. It ran in *The Washington Post* and *The Seattle Times*, as well as in regional, trade and military publications. The campaign also featured a TV spot that aired over the U.S. Memorial Day holiday last month.

On the Cover

16 Dream roll

It was just two and a half years ago that Boeing broke ground on a final assembly factory in South Carolina for production of 787s. The dream became a reality April 27, when several thousand employees and guests celebrated the rollout of the first 787 Dreamliner built in North Charleston. This photo essay captures the excitement surrounding that historic day.

COVER IMAGE: BOEING SOUTH CAROLINA EMPLOYEES AND OTHERS CELEBRATE THE FIRST 787 BUILT AT THE NORTH CHARLESTON PLANT. BOB FERGUSON/BOEING

PHOTO: THE ROLLOUT OF THE SITE'S FIRST COMPLETED 787. BOB FERGUSON/BOEING

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30 Show and tell

Tours of Boeing's twin-aisle jetliner plant in Everett, Wash., the world's largest building by volume, make it one of the most popular tourist destinations in Washington state. It's an experience made all the better by the Boeing employees who serve as guides. PHOTO: BOB FERGUSON/BOEING

INSIDE

CORRECTION:
Page 23 of the May 2012 issue of *Frontiers* misstated a company's name. The correct name is IHI Aerospace.

38 Long live the Queen!

With delivery of Lufthansa's first 747-8 Intercontinental, a new chapter begins for Boeing's iconic passenger airplane, known as the "Queen of the Skies." With a new wing, engines and other improvements, the Intercontinental represents a significant leap in efficiency and passenger experience. PHOTO: BOEING

PROUD BOOTS IN THE AIR FOR 100 YEARS.

1912 2012

MARINE AVIATION CENTENNIAL

We're proud to join the U.S. Marine Corps in celebrating the Marine Aviation Centennial. We salute all who've served on the ground, at sea, in the air and in space to make Marine aviation all that it is.

BOEING

Better together

Boeing and its industry partners must together solve the difficult challenges ahead

At Boeing, we value the synergy of our enterprise capabilities and talents. We define that value for ourselves and our customers as "One Boeing" and know what we can do together is greater than what we can accomplish individually. In short, we are better together.

The same can be said for the aerospace community.

That was my message when I spoke at the annual Aviation Summit, hosted by the U.S. Chamber of Commerce, in April: Commercial, defense and space sectors—as well as the U.S. government and the governments of our global partners—are a force to be reckoned when we move forward as one. Together, we have what it takes to solve the difficult challenges before us.

Historically that's also been true with many of the technologies that make air travel safer and more reliable—including radar and GPS, originally developed in defense and space programs.

Today, while collaboration has started, we must do more in such areas as advancing NextGen Air Traffic Management, or ATM, improving cybersecurity, expanding biofuels use and developing the talent pipeline, all of which will help build the economy and improve global security.

On NextGen ATM, for example, we need to make better progress toward faster, safer and more environmentally responsible air travel and enable unmanned systems to fly in today's manned airspace. Likewise, with dependence on networks growing exponentially, we can't afford not to invest in cyber-protection for that infrastructure. And while Boeing has made great progress using biofuels in both our commercial and defense platforms, keeping that momentum going across industry is critical.

Accomplishing all that we can in these technological areas demands talent that's in short supply. At the same time defense and space budgets are being cut and increasingly more baby boomers are eligible to retire, not enough young people are pursuing engineering and technical degrees.

At Boeing we share talent across the enterprise as markets and budgets shift to preserve and grow skills. We also tap into a rich source of talent and leadership by hiring military veterans returning to civilian life.

"Inspired by the importance of the work we do and the customers we serve, we surely can solve these technical and pipeline challenges."

– Dennis Muilenburg

President and chief executive officer
Boeing Defense, Space & Security

PHOTO: BOB FERGUSON/BOEING

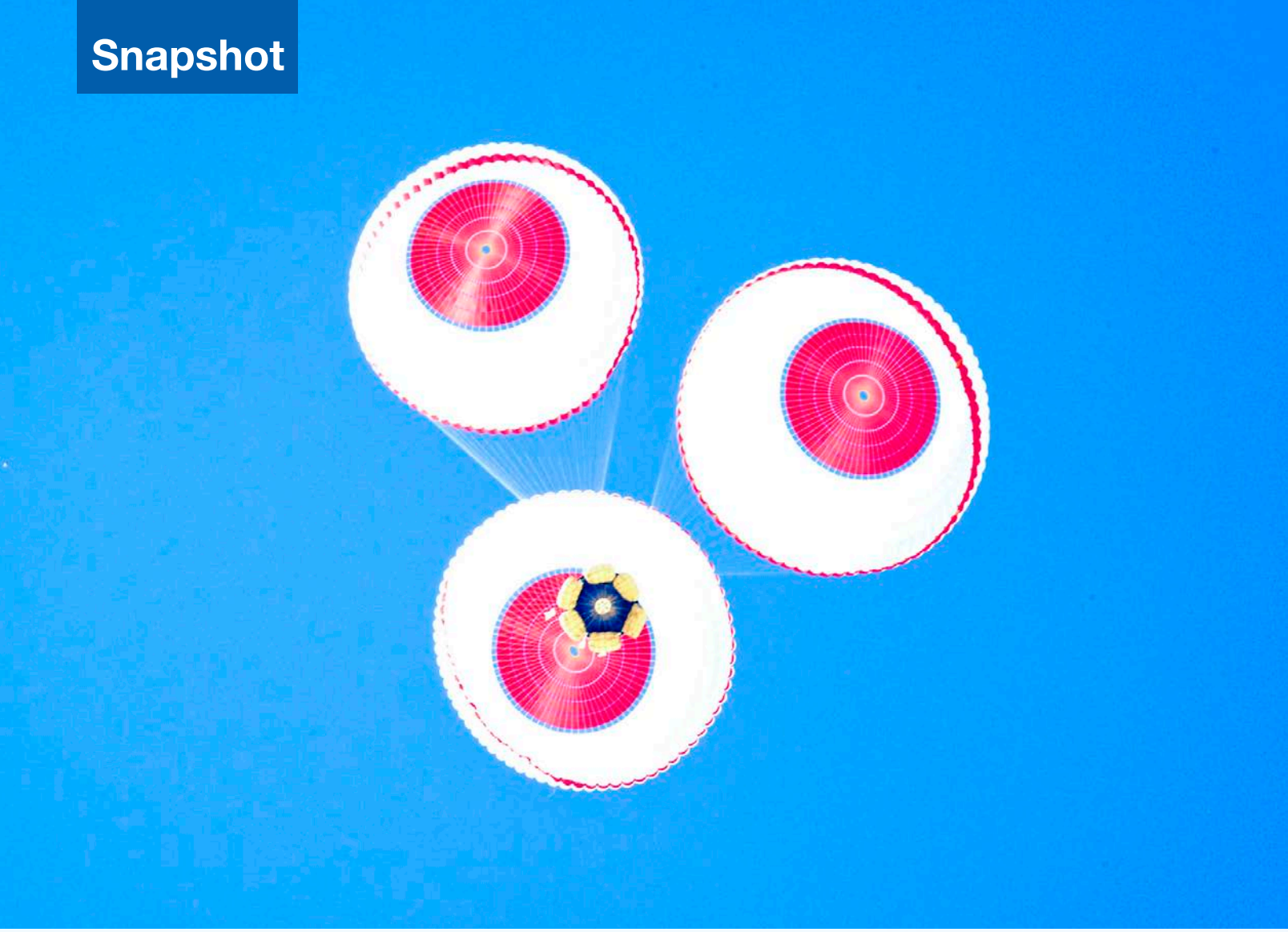
Beyond that, we have to reinforce the talent pipeline. We need to think about it as we think about designing a new product: It's a life-cycle proposition. From early hands-on programs, such as FIRST Robotics for students, to internships, job rotations, meaningful assignments, leadership development and supportive work environments for employees, our focus must be on investing in our people every step of the way.

Inspired by the importance of the work we do and the customers we serve, we surely can solve these technical and pipeline challenges.

As One Boeing, we will continue to work with industry partners, governments and policymakers to further progress. That responsibility starts with each one of us demonstrating excellence, integrity and accountability every day, with a One Boeing headset—as Boeing employees and as members of the aerospace community.

Thanks for all you do. ■

Snapshot



CATCHING AIR: Boeing recently completed a second successful parachute drop test of the Crew Space Transportation spacecraft, or CST-100, which is being built for NASA and would carry up to seven astronauts to the International Space Station or other low-Earth orbit missions. The craft was dropped by helicopter from about 14,000 feet (4,720 meters) and descended using three main parachutes to a soft landing on the Delamar Dry Lake Bed near Alamo, Nev. Six inflated air bags helped cushion the landing. PHOTO: ELIZABETH MORRELL/BOEING

Quotables

"In the Apache, it's those split-second decisions that can save lives."

– Rob Lenahan, Systems Engineering manager for Training Systems and Government Services and instructor for the Apache Longbow Crew Trainer, on the value of Boeing simulator training. See story on Page 34.

"It really beats the competition on fuel burn. It really beats the competition on reliability … they just made that airplane better and better over the last 20 or 30 years."

– Mike Van de Ven, chief operating office of Southwest Airlines, which has operated only Boeing 737s since the airline's start in 1971. USA Today, *April 16.*

Material advantage

Researching advanced sealants and coatings that also are better for the environment

By Tom Koehler

In this *Frontiers* series that profiles employees talking about their jobs, Boeing Research & Technology's Pat Kinlen, a research chemist, shares how he is working to develop advanced coatings that can sense corrosion at the molecular level and stop it before major damage occurs. PHOTO: MARIAN LOCKHART/BOEING

I enjoy building things and taking things apart to understand how they work. Working with advanced polymers, which I have done for the past 30 years in the lab and in the plant, is no different, since polymers are simply large molecules comprising many smaller, repeating molecules. It's just understanding how something works—at the molecular level.

I especially enjoy working on technologies that are "needle movers"—things that have great potential to add major value and make real improvements for customers in the years ahead. Before joining Boeing's Chemical Technology organization in Seattle a year ago, I was the chief technology officer at Crosslink in St. Louis and a science fellow at Monsanto. I have filed more than 25 patents in my field—electroactive and conductive polymers—which offer many interesting possibilities for making future sealants and coatings easier and more economical to apply, more durable and more environmentally responsible. Electroactive polymers are those that exhibit a change, usually in size or shape, when stimulated by an electric field; conductive polymers conduct electricity.

Lately, my colleagues and I have been working on nontoxic "smart" coatings for aluminum surfaces on commercial airplanes and defense products based on electroactive polymers. When corrosion occurs on metallic surfaces, it creates an electrochemical potential, or tiny electric current or charge. The idea is to develop electroactive coatings that can sense this and release inhibitors to neutralize corrosion processes before they cause potential structural damage. Also, while current coatings are effective at preventing corrosion, many employ hexavalent chromium, a highly toxic chemical that the industry is working to phase out.

In addition to corrosion protection, we are working with universities and research and development partners on polymers that can be self-cleaning, scratch and mar resistant, drag-reducing, lighter-weight, ultraviolet radiation resistant, better able to shed water and ice, self-healing, or can even conduct, capture and store energy.

I don't think there's been a more exciting time to be an aerospace research chemist. I am pleased to be part of the innovative team at Boeing Research & Technology that is connecting great ideas with some of our customers' toughest technology challenges. ■

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One for the ages

The B-52 bomber keeps going and going and going

By Mike Lombardi

It is the "youngest" B-52 Stratofortress.

Fifty years ago this month, the last B-52 rolled out of Boeing's plant in Wichita, Kan.

With tail number 61-0040, that final B-52H ended a production run that had begun almost 11 years earlier at Boeing Plant 2 in Seattle, when the secret XB-52 was rolled out in the early morning of Nov. 29, 1951, under cover of darkness and literally under cover—draped in giant canvas sheets.

Today, with more than 21,000 flight-hours and 50 years behind it, 61-0040 remains in service with 75 fellow B-52Hs. Now camouflaged in an ominous finish of overall gray and known by the affectionate name of "BUFF" (Big Ugly Fat Fellow), the airplanes are veterans of the Cold War, Iraqi Freedom and Enduring Freedom and still serve as a key part of the U.S. Air Force Global Strike Command.

"On this 50th anniversary of the 'youngest' B-52, we should take time to remember and salute all those responsible for conceiving, designing, building, maintaining and flying this remarkable aircraft," said Richard P. Hallion, former chief historian for the U.S. Air Force.

"The B-52," he added, "will always constitute one of the proudest accomplishments of Boeing, its industry partners and the U.S. Air Force."

It is one of the longest-serving aircraft in aviation history, a testament to the eight-engine bomber's rugged design—and its ability to adapt to new missions and new capabilities.

After considerable flight testing and design work, including a major change from seating the pilots in tandem to a side-by-side configuration, the first production B-52A rolled out of Plant 2 in Seattle in March 1954. In all, Boeing workers in Seattle produced 278 B-52s, including all early A, B, C models and shared production of D,E,F models with Wichita. By November 1958, production ended in Seattle and had shifted entirely to Wichita, where 466 B-52s were assembled, including all G and H models. Overall, Boeing produced 744 B-52s.

When 61-0040 was delivered in October 1962 it was the height of the Cuban missile crisis and one of the darkest moments of the Cold War.

At that time, Strategic Air Command (SAC) of the U.S. Air Force was in charge of America's land-based strategic bombers and ballistic missiles, and the weapon that best symbolized SAC and its motto of "Peace is our profession" was the B-52.

With its finish of polished aluminum and anti-flash white, 61-0040 was specifically designed to carry four Douglas GAM-87 Skybolt hypersonic nuclear-tipped ballistic missiles, as well as the McDonnell GAM-72 Quail decoy missile and free-fall nuclear bombs.

What gave the B-52 such longevity and made it such a success? A major factor is the thousands of dedicated Boeing and Air Force leaders, engineers, flight crews, ground crews and machinists who have worked together to continually modify and improve the B-52 over more than 60 years.

"The longevity of the B-52 is due to the outstanding relationship between the people at Boeing and the Air Force," said Richard W. Taylor, who was head of engineering for the B-52H program.

Another important factor was a sound basic design that represented the cutting edge of aircraft technology when introduced decades ago. That design, coupled with the strength and durability that Boeing built into the B-52, enabled it to carry everything from the X-15 rocket plane to a conventional bomb load equivalent to that of eight World War II B-17Gs.

As a result, the B-52 has outlasted several would-be replacements, while maintaining the Boeing bomber legacy.

As then Gen. Nathan Farragut Twining, U.S. Air Force chief of staff, said at the rollout of the first B-52A: "This airplane has a lot of tradition to uphold in the Air Force and in the company, and I am sure it's going to do better than any of them."

With more than 50 years of service, the B-52 has certainly upheld that tradition. ■

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PHOTOS: (Left) The last B-52 built, tail No. 61-0040, in 1965. **BOEING ARCHIVES** **(Above)** Airmen from the 36th Expeditionary Maintenance Squadron with 61-0040 in May. **U.S. AIR FORCE**

Earthy endeavors

Boeing employees join in to support global Earth Day activities

Whether it was digging holes to plant trees in the United Kingdom or collecting trash from the Duwamish Waterway in Seattle, thousands of Boeing employees, their family members and friends at more than 120 locations around the world pitched in to celebrate and support Earth Day activities in late April. All year round, Boeing and its employees support community-based programs and work-site activities that inspire environmental citizenship, educate people to minimize their impact on the environment, reduce greenhouse gas emissions, increase recycling and energy efficiency, and protect and restore critical natural assets and habitats.

PHOTOS: (Clockwise from far left) Children attending the Charleston County Earth Day Festival in South Carolina create Earth Day–themed artwork at the Boeing exhibit. ALAN MARTS/BOEING Boeing Mesa volunteers clean up metal casings and other debris from the U.S. Forest Service Hewitt Canyon in Arizona. BRYAN LEWIS/BOEING Boeing employee Garrett Flowers spreads mulch at the Duwamish Hill Preserve in the Puget Sound area. STEPHANIE SCHUSTER/BOEING Ming Xi Chen (from left), Andy Latumahina and Ranuka Abeysinghe, Boeing Aerostructures Australia employees, helped plant 410 trees near the Fishermans Bend facility in Melbourne. BOEING In partnership with Earth Restoration Service, an environmental nonprofit group, Boeing UK volunteers and schoolchildren planted 270 trees at four schools near Boeing sites. JEANINE SWAINE/BOEING Boeing employees brought their families and friends to Southern California's Earth Day Volunteer Event with TreePeople for a day of service. Pictured are, from left, Nancy, Hannah and Elanor Whitesides. VANESSA PEREDA/BOEING Boeing volunteers Katie Moxley, left, and Wayne Schlappi joined with more than 250 Boeing employees, friends and community residents to haul to shore trash collected from the Duwamish Waterway and clean up parks in South Seattle. BOEING; LANDSCAPE PHOTOS AND GARDENING TOOLS: THINKSTOCK

Inspiring minds

Boeing mentors help excite students about careers as engineers and scientists

By Chamila Jayaweera and Peter Pedraza

PHOTOS: (Above, from left) Luther Banner, center, was mentored by Boeing employee Tom Wendel when he participated in FIRST and subsequently won a full scholarship to the Massachusetts Institute of Technology. RICHARD RAU/BOEING Bill Campisteguy of Boeing works with students from the Skunkworks Robotics team on its practice robot. MARIAN LOCKHART/BOEING Students from the Downingtown Area Robotics team; the Eagle Robotics team. RICHARD RAU/BOEING

Bill Campisteguy loves the excitement. It's "magic," he explains. But he's not talking about being part of the engineering team on Boeing's new 737 MAX program, where he is a Flight Sciences manager.

Rather, it's watching high school students from across the United States cheering on their teams and the high-tech robots they've built themselves, as they compete head to head in stadiums normally reserved for sporting events.

Wanting to inspire future engineers, he signed up six years ago for FIRST (For Inspiration and Recognition of Science and Technology), a nonprofit organization based in Manchester, N.H., with the goal of motivating young people to pursue career opportunities in science, technology, engineering and math, or STEM.

Campisteguy and other Boeing volunteers share their skills and talents as mentors to student groups as they build and compete complex robots in a short six weeks from a common box of parts.

"It's amazing to see how quickly students pick up process management related to technology and adapt to the challenges they are given," said Campisteguy, who mentors the Skunkworks Robotics team from Aviation High School in Des Moines, Wash.

"It's incredible to be a part of the excitement and to watch students bring their creations alive—it's magic."

And the need for workers with STEM skills remains high. According to a recent U.S. Department of Commerce report, STEM occupations are projected to grow by 17 percent from 2008 to 2018, compared with 9.8 percent growth for non-STEM occupations.

Nearly 60,000 students participate in FIRST competitions. But it's not just the students who benefit. Employees who volunteer grow professionally while they prepare students for future careers.

"FIRST is a great way for students to get excited about engineering, but it also teaches them how to contribute toward a common goal and work together," said Michelle Crivella, a Boeing Defense, Space & Security Technical Fellow who has mentored teams for three years, most recently the LuNaTeCs, whose students come from various schools in southern New Jersey.

"By being mentors and role models," Crivella added, "we can help students be the very best they can be so they can be successful in whatever they decide to do."

Over the years, Boeing has donated scholarships and many employees have volunteered as mentors to guide teams of students through building a robot. This year Boeing supported nearly 200 teams that participated in regional competitions, with 48 teams advancing to the FIRST Robotics Championship in St. Louis in late April.

"FIRST instills self-confidence and knowledge by challenging students to solve problems as teams," said Conrad Ball, Boeing Military Aircraft chief engineer, who leads Boeing's support of FIRST in Washington state.

"But the robots are only the hook—the power of FIRST lies in fostering lasting relationships between students and mentors, and the hands-on experiences that help students imagine themselves as scientists and engineers."

Seven years ago, Tom Wendel, a Technical Fellow with Boeing Defense, Space & Security, signed up to lend his expertise to his daughter's robotics team, the Robohawks, at Hazelwood Central High School in Florissant, Mo. He's been hooked ever since.

"Students gain new awareness for what they are doing with their teammates and confidence in their technical and leadership skills as they compete for champion status," Wendel said.

He is especially proud of 18-year-old Luther Banner, one of the students he mentored. Under the guidance of Wendel, Banner helped lead his team—the Robohawks—to success in FIRST competitions and in the community. That in turn helped Banner obtain a full scholarship from the Massachusetts Institute of Technology, where he plans to study engineering.

It's the kind of success story Wendel hopes will inspire others to get involved in FIRST, either as mentors or volunteers. ■

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PHOTOS: More than 10,000 students from all over the world competed in the 2012 FIRST Robotics Championship in St. Louis. This year's challenge involved two competing teams' robots shooting basketballs into different-height hoops during a two-minute, 15-second match. **(Clockwise from top)** Tom Wendel, right, of Boeing works with students from the Shrapnel Sergeants team; Paul Heumphreus, left, of Boeing works with a student competitor on the robot "Thorandor." RICHARD RAU/BOEING Michelle Crivella of Boeing and a student competitor tweak the robot "Sam Swoosh"; Crivella practices shooting hoops with the LuNaTeCs robotics club. FRED TROILO/BOEING

"Our efforts here at Boeing South Carolina can be summed up simply: Thousands of people, millions of stories, one dream."

– Michael E. Potts, BSC Final Assembly

PHOTOS: (Top) Boeing South Carolina employees and invited guests take a closer look at the site's first 787 Dreamliner following the rollout event. **(Insets)** April 27 was a day of celebration as the first South Carolina–built 787 rolled out of the Final Assembly facility in North Charleston.

'We build jets!'

With the rollout of their first 787, Boeing South Carolina employees join a special fraternity

Photos by Bob Ferguson

It was a remarkable day. And a day for "The Remarkables."

To chants of "We build jets" by several thousand employees, the first 787 Dreamliner assembled at the Boeing South Carolina site in North Charleston rolled out of final assembly April 27—a celebration of what Boeing people working together can accomplish.

The rollout marked the first time a Boeing commercial jetliner has been built on the East Coast of the United States.

Jim Albaugh, president and chief executive officer of Boeing Commercial Airplanes, may have summed up the history-making occasion best when he told employees: "Today, I welcome the South Carolina team into a small and elite fraternity, a fraternity of workers who have built one of the most complex machines in the world—a commercial airplane."

Boeing now has employees on both coasts of the United States who are producing 787s. Dreamliners built in Everett, Wash., already are carrying passengers. This first one built in South Carolina is scheduled to be delivered mid-2012 to Air India. Three more 787s are in final assembly at the North Charleston facility;

"It was like sharing a new member of the family with all your friends."

– James Berry Jr., BSC Final Assembly

Boeing South Carolina eventually will produce three Dreamliners a month at full capacity.

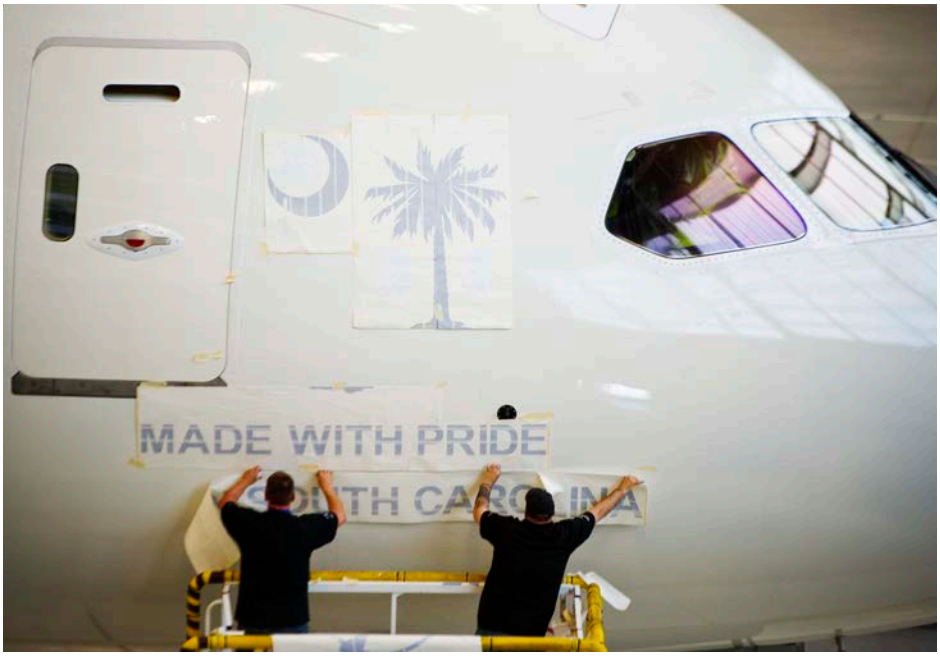
Jack Jones, general manager and vice president of Boeing South Carolina, noted this first 787 rollout occurred about two and a half years after Boeing broke ground on the final assembly facility.

"I'd never take the name of The Incredibles," Jones told employees. "You are The Remarkables," he said. The Incredibles was the nickname given the Boeing team that designed and built the first 747 in the 1960s.

Celebrating the Boeing South Carolina rollout were an estimated 7,000 Boeing employees and invited guests.

One of those employees was Martha Oliver, an industrial engineer for 787 Aft Body at the North Charleston facility. She watched the rollout with great pride, as did her dad—but he was following the event on TV.

"I can picture him watching it on TV, smiling ear to ear knowing that his little girl was a part of history," she said. "I am so grateful that I will have this memory to share with my own children one day." ■



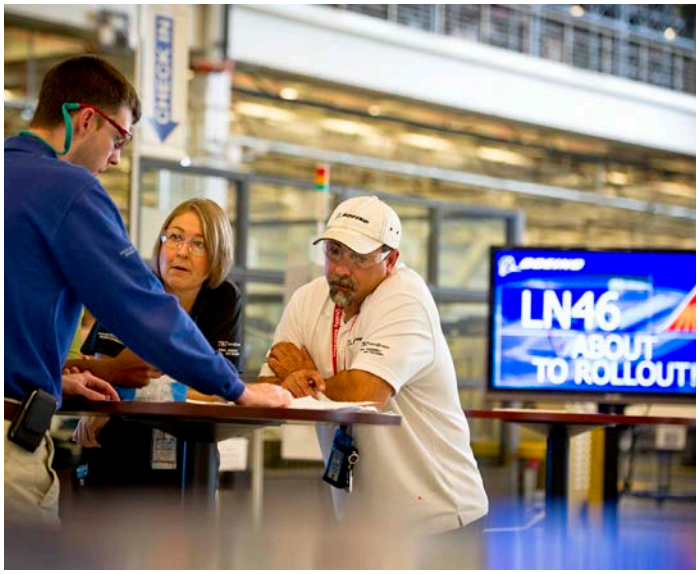
PHOTOS (Clockwise from far top left): Plasma screens at Boeing South Carolina counted down the days to the first rollout; the airplane is prepared for its public debut; markings are applied for the rollout event; Boeing's Tarun Hazari, regional director of Passenger Experience and Airline Revenue (center), prepares to shoot a video with a local TV crew in the interior of the first 787 built in South Carolina; view from the 787 flight deck; employees attend to details large and small before the rollout.


BOEING
PROCESS & TOOL SUPPORT
Brandon Heyward

"I have never experienced an airplane rollout so special and so meaningful to so many teammates."

– Doug French, BSC Liaison Engineering

PHOTOS: (Left) A procession of more than 6,000 cheering Boeing South Carolina employees arrives at the rollout event waving commemorative marshalling wands. **(Insets)** Employees greet the airplane with anticipation and excitement (top left and bottom row); students from Joseph Pye Elementary School (top right) and Burke High School (middle left) and Sound Crew (middle right) entertained the audience before and during the rollout.



"I've lived in the Charleston area for over 15 years, and I have been proud to say I've worked at Boeing South Carolina for the past three years. In all the years of being here, I have never known any company that has instilled such pride in our workers."

– Stephen West, BSC Aft Body Operations

"It's amazing to think that I had some small part in all of it. Not too many people can say that they have been part of such a historic event."

– Theresa Futch, BSC Quality Engineering

PHOTOS: (Above) In the background at the 787 rollout ceremony was the Dreamlifter, left, a modified 747 used to ferry large sections of the 787 for final assembly. **(Insets, from far left)** A scene from the rollout; employees review details before the event; Monica Wise watches the rollout; smoke-generating machines made for a dramatic backdrop as the 787 emerged from the factory.

Ahead for safety

Boeing South Carolina site builds 787s—and a culture of safety

By Rob Gross

It's called the "bump cap," and it represents a small part of a culture of safety that has resulted in Boeing South Carolina employees recently setting a site record of 3.5 million hours without anyone missing time off from work because of an injury.

A big part of staying safe is identifying potential hazards and trends before they can lead to serious injury.

The idea behind the cap came from an Employee Safety Team meeting at the North Charleston site, where the issue was raised that employees were bumping their heads in confined 787 fuselage spaces. Conventional hard hats had been tried and rejected as being too hot and bulky.

The solution?

After checking with Environment, Health and Safety, the team identified a different type of protective headgear—the bump cap, which is lightweight and resembles a baseball cap.

"We identified a cap that's well ventilated and pretty stylish," said Yeakia Johnson, who leads the Employee Safety Team.

"It received positive feedback during a trial evaluation, so we introduced it across the site," Johnson added. "Now our production teammates can be issued a bump cap before entering environments where head bangs, cuts and lacerations are possible."

It's all part of staying safe at the Boeing South Carolina site.

"What's really interesting about Boeing South Carolina is that we had the opportunity to start from scratch and define a culture that makes safety everybody's job from day one," said Penn Onaraha, an organizational development expert with the Interiors Responsibilities Center, South Carolina. "That's resulted in a spirit I haven't experienced anywhere else in my 25 years at Boeing."

As Boeing's newest manufacturing center, Johnson explained, the site faced a huge challenge: how to get employees to understand the importance of safety from day one.

The answer was to define and foster a culture that makes workplace safety second nature. The site's Employee Safety Team created a document called Safe Work Area Rules, or SWAR, which is a blueprint that site personnel follow to build that record of safety.

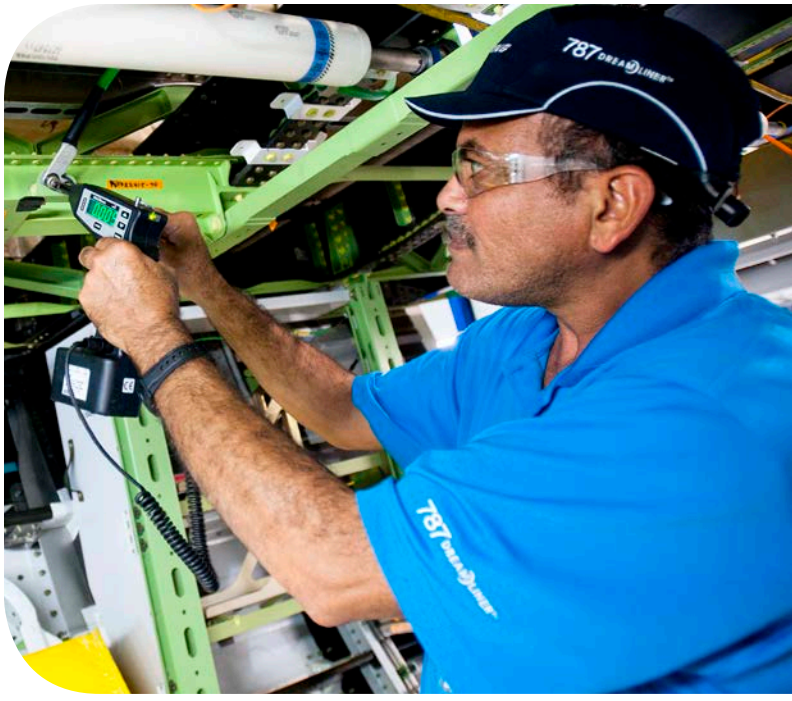
"Although hardly anyone has been here more than five or six years, safety is something we've been clearly focused on from the outset," said Albert Hall, a flight-line readiness technician at the North Charleston site.

"It's a mindset," he added, "that puts the immediate task second to being safe, not cutting corners, and speaking up if you see something that could cause an incident or accident."

For new Boeing South Carolina employees, the importance of safety begins at orientation. And it continues in day-to-day operations. Safety minutes start most meetings, and there are daily safety messages to all employees that share relevant information and insights.

By design, safety content also is highly visible on the large plasma screen "performance boards" that production workers consult to check schedule and other manufacturing information. And when a safety incident or "near miss" does occur, a process exists to ensure identification of the root cause and implementation of a team-based solution.

"It's personal," said Jermaine Simmons, a composite manufacturing technician. "On-the-job safety is what happens when we accept responsibility for not just our own individual well-being but also that of our teammates. We look out for each other and are accountable to one another."



> "We had the opportunity to start from scratch and define a culture that makes safety everybody's job from day one."
>
> *– Penn Onaraha, an organizational development expert with the Interiors Responsibilities Center, South Carolina*

Tom Deem, Environment, Health and Safety site leader for Boeing South Carolina, said employees "understand what we're trying to do on the safety front and run with it, making it their own."

But worker safety is a continuing journey.

"I'm proud of what our team has accomplished to date and believe the best is yet to come," said Jack Jones, Boeing South Carolina vice president and general manager. "It's the responsibility of each and every teammate to focus squarely on safety every day as we continue our vital manufacturing operations and begin delivering airplanes of the highest quality to Boeing customers worldwide." ■

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PHOTOS: (Left) This lightweight, well-ventilated "bump cap" is now available to all Boeing South Carolina employees who work on the production floor. **(Above)** Boeing South Carolina Aft Body Manufacturing Technician Abdul Mahmoud wears a bump cap while working in the aft-body section of the 787. **ALAN MARTS/BOEING**

Innovation in any language

Boeing technology center in Spain connects the company with the best of European research and development

By Eric Fetters-Walp

Research engineer Marisol de Mena studies human factors and how to integrate aeronautical systems into the flight decks of commercial airplanes to reduce pilot errors and improve safety.

It's just one example of the work taking place at Boeing Research & Technology–Europe, which will mark its 10th anniversary next month.

Based in Madrid, the center's talented employees like de Mena are matching ideas generated in Europe with the needs of Boeing's customers to create innovations in areas such as environmentally progressive airplane interiors, cutting-edge fuel cells and systems to improve air traffic management—technologies that could be incorporated into airplanes and aerospace during the coming decades.

Francisco "Paco" Escarti, managing director of BR&T-Europe since 2004, said the center's location provides Boeing with access to the continent's advanced research, especially in relation to the environment, safety and reliability, and air traffic control.

"I think our primary mission is to connect Boeing with Europe's talented research and development community and the important projects under way here in a mutually beneficial way," Escarti said. "We are Europeans who are adding value in Europe, for Europe and for Boeing, as well as the entire aerospace industry. With more than 50 highly qualified technologists, we have become a key technology integrator in Europe and the center of gravity for a significant amount of European research activity."

That's not an overstatement: Scientists and engineers from the center in Madrid work with more than 200 companies and 45 universities in 21 nations. In de Mena's four-person group alone, the researchers all hail from different countries across Europe—Ireland, United Kingdom, Spain and Germany.

One of the research projects de Mena is part of is developing new concepts used in training pilots to recover an airplane that experiences a loss of control. It's known as upset recovery. Research shows that pilots perceive a particular upset situation during flight differently from when they are in a ground-based simulator. The aim of the research is to reproduce motion cues in the simulator that more closely mimic what pilots experience in actual flight during an upset.

The Madrid center is ideal for this kind of research, explained de Mena, an aviation psychologist and senior safety analyst.

"Our diverse educational backgrounds from different countries, along with our contacts at European universities and companies, have been very beneficial in developing collaborative research projects and obtaining grant funding," de Mena said. "This enables Boeing to be up-to-date in the vanguard of

PHOTO: Marisol de Mena, an aviation psychologist and senior Human Factors and Safety analyst, takes in the view from the top of the Boeing Research & Technology–Europe building with Madrid-Barajas Airport in the background. ASSOCIATED PRESS

“This enables Boeing to be up-to-date in the vanguard of technology developed in Europe.”

– Marisol de Mena, senior Human Factors and Safety analyst


Featured Initiative: Collaboration with Airservices Australia
DELL

technology developed in Europe."

In turn, Europe has a better appreciation and understanding of Boeing.

Grzegorz Kawiecki, a systems engineer and Associate Technical Fellow who helps lead BR&T-Europe activities in Poland, said the center is well-integrated into European research and development.

"This makes it easier to follow new European science and technology developments and, if of interest, help to implement them to improve the competitive edge of Boeing," he said.

On occasion, the Madrid center has teamed with competitors in the name of improving commercial aviation. Boeing researchers there have teamed with Airbus researchers for a European Union project on unusual atmospheric conditions that can affect aircraft and air travel, such as when volcanic ash is present. That project is not just hypothetical; eruptions from Icelandic volcanoes in recent years have at times significantly disrupted European and trans-Atlantic air travel.

Research coming from BR&T-Europe also has global relevance. The Madrid center's work on air traffic management, fuel cells, environmentally progressive materials, and unmanned aerial systems management and safety is being done in conjunction with Boeing's other research centers in the United States, Australia, India and China.

In the realm of air traffic management, the BR&T-Europe team is studying how to define and manage aircraft flight paths for manned, unmanned and mixed air traffic. The work has led to more precise trajectories for unmanned aerial systems—a development that was demonstrated last year during flight trials in Odense, Denmark.

Those ideas can be applied to commercial flights, and BR&T-Europe is working with Aena, the air navigation service in Spain, and Air Services of Australia to redesign commercial airspace routes to use continuous descent approaches, which can save fuel and reduce noise over residential areas near airports.

In the fuel cell field, BR&T-Europe's center in Madrid already has made history. Three years ago, the center's engineers flew a manned fuel-cell-powered aircraft and since have focused fuel cell research on unmanned aerial systems applications. Researchers also have worked on developing heavy metal-free coatings for aluminum and steel, natural fiber-based light panels and environmentally sensitive aircraft interiors.

The research into human factors safety issues and air traffic management by de Mena and her colleagues is being done in close partnership with Commercial Airplanes. That type of "One Boeing" cooperation between the Madrid center, the rest of BR&T and the business units ensures the research benefits all of the company.

"As the hub for such coordination, we're able to provide in-country support to all Boeing business units to manage engagements with European partners and, thus, increase Boeing's productivity in technology projects with regard to time, cost and quality," said Stephan Eelman, director of research and technology in Germany and deputy director of Engineering and Programs for BR&T-Europe.

In April, Boeing announced plans to form its sixth research center outside of the United States—Boeing Research & Technology–Brazil in Sao Paulo. When it opens later this year, it will join with the company's centers in Australia, India, China, Russia and Spain to help provide Boeing with a global view of technology developments, and as hubs for engagement with the world's top technologists wherever they may be located.

As the leader of BR&T-Europe and a Spanish citizen, Escarti is proud of his team's contributions to the company's technology portfolio. And Matt Ganz, BR&T vice president and general manager, believes that pride is deserved.

"BR&T-Europe has been an outstanding example of our strategy and commitment to work with the best technology experts in the world," Ganz said. "Much has been accomplished during the past 10 years, and we are counting on even more innovation in the years ahead." ■

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PHOTO: Christian Grabow, right, of Boeing Research & Technology–Europe's Trajectory Technologies Group, works with software and systems engineers in the Madrid lab.
ASSOCIATED PRESS

A walk to remember

At the massive Everett jetliner plant, tour guides tell the Boeing story to visitors

By Deborah Feldman and photos by Bob Ferguson

Whether they live a few miles down Interstate 5 or traveled from across the world, this is likely not what they expected when these visitors decided to take the 90-minute tour of Boeing's sprawling Everett, Wash., factory to see how the company's twin-aisle jetliners are assembled.

Still, the group sits silently at the Future of Flight Aviation Center, where the tour begins, as Boeing guide Christopher Summitt introduces himself in a booming and theatrical voice, occasionally rolling his R's for emphasis in near-Shakespearian delivery. He wears a black beret-like cap and sports a pair of shocking mutton chop sideburns that extend well past his chin. They are a critical component for his after-hours work as a volunteer in historical re-enactments.

Regardless of Summitt's unexpected appearance and delivery, the audience quickly succumbs to his character and charisma. First stop is the extensive tunnel system that runs beneath the factory. After an elevator ride up, the tour group peers over a balcony alongside the 747-8 bay where they can see the airplanes in all stages of production.

"This is right up my alley," Summitt says between tours. "The story of Boeing is so significantly a part of the story of aviation as a whole. It's an epic story! And as a guide, I like to tell it in a truly epic way."

Summitt grew up just a bike ride away from the runway at Paine Field adjacent to the Everett factory. His father worked as an engineer on the hydraulics and flight controls of several models of Boeing airplanes.

Summitt is one of nearly a dozen Boeing employees who conduct year-round public tours at the Everett factory. During busy summer months, the staff doubles to accommodate demand.

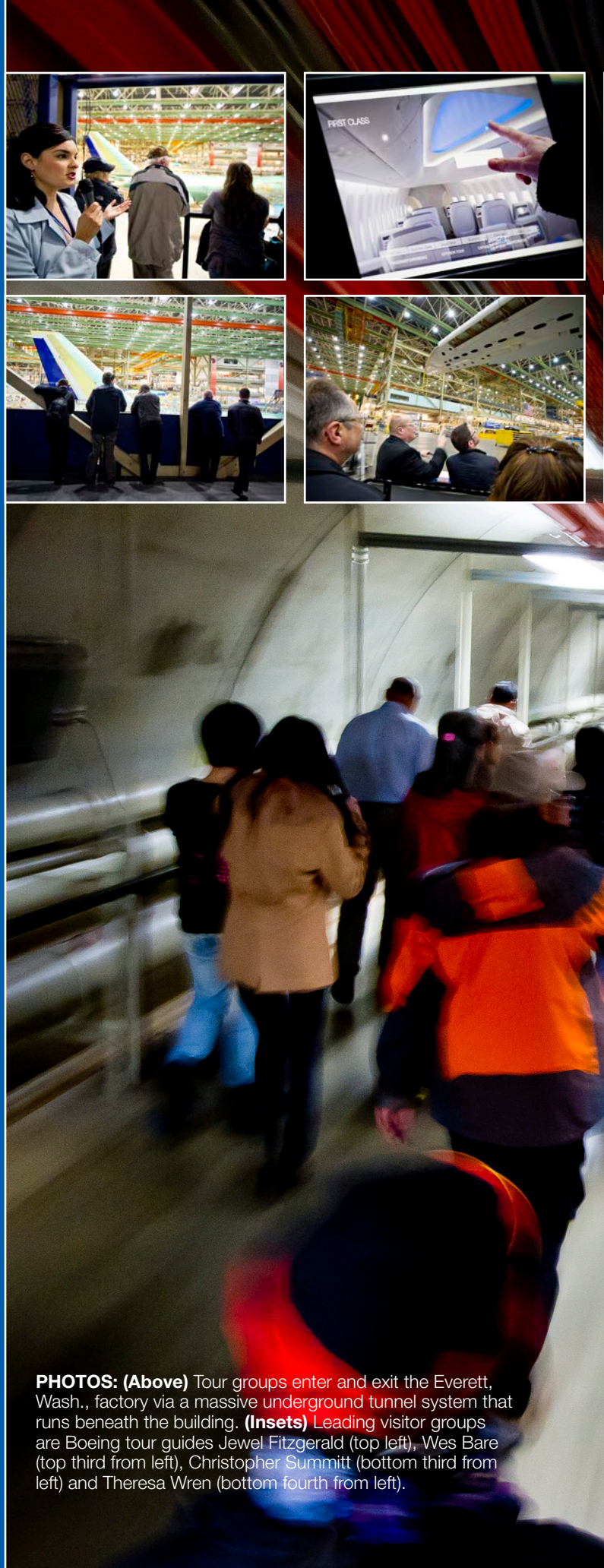
It's one of the most popular guided tours in Washington state. The Everett factory is the largest building by volume in the world, big enough to accommodate all of California's Disneyland inside, as well as 12 acres (5 hectares) of parking.

Guides have a broad range of backgrounds—one is also a radio host, another is an actress, some spent years in other jobs at Boeing. But now all are highly visible Boeing ambassadors to the roughly 200,000 visitors at the Everett factory each year.

Tour guides each place a personal stamp on the basic tour script.

One of the guides, Jewel Fitzgerald, is a trained flight attendant who says she's always been captivated by aviation.

"I love being around this kind of energy, forward thinking and



PHOTOS: (Above) Tour groups enter and exit the Everett, Wash., factory via a massive underground tunnel system that runs beneath the building. **(Insets)** Leading visitor groups are Boeing tour guides Jewel Fitzgerald (top left), Wes Bare (top third from left), Christopher Summitt (bottom third from left) and Theresa Wren (bottom fourth from left).





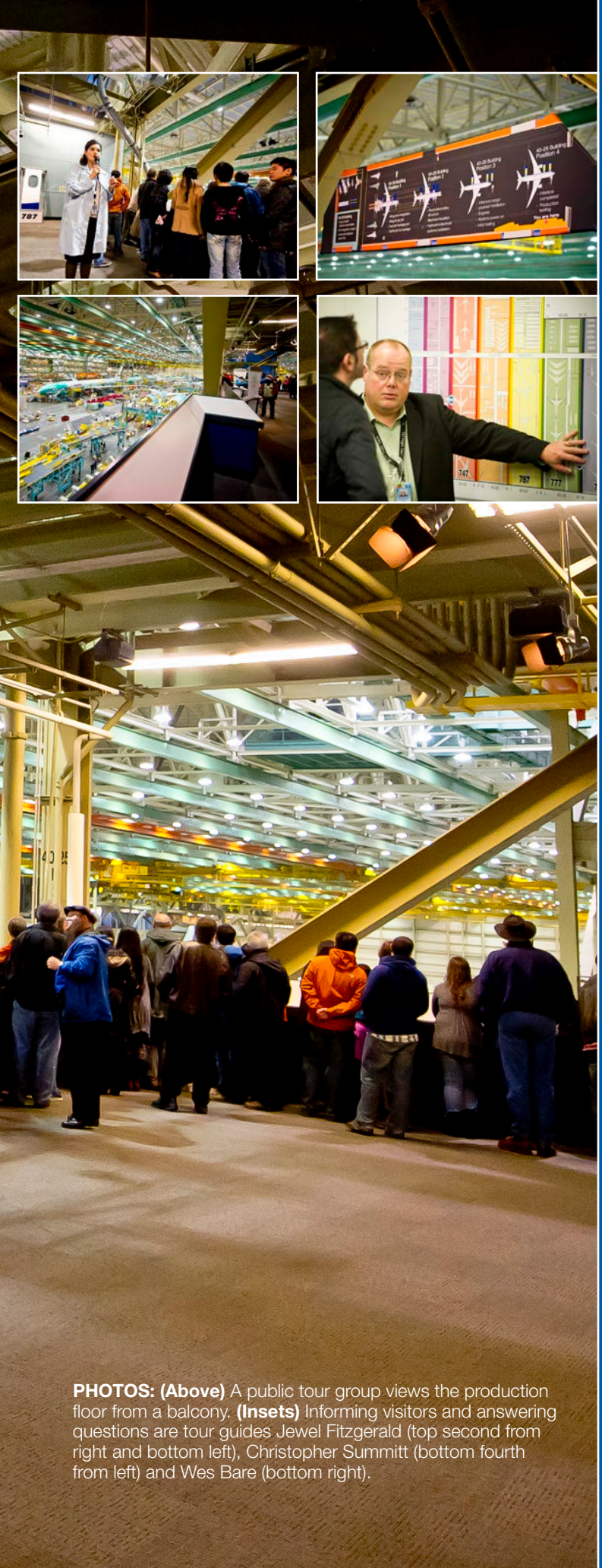




Fun facts

During a tour of the Everett plant, visitors may learn that:

- At one time rain clouds formed in the plant before a state-of-the-art air circulation system was installed.
- The truck beam in the landing gear of a 777 (where the six wheels are attached) is made from a single forged piece of titanium. It is the most expensive part of the airplane after the engines.
- The 747 is so large that the horizontal stabilizer has the same area as the wings of Boeing's single-aisle 737.



PHOTOS: (Above) A public tour group views the production floor from a balcony. **(Insets)** Informing visitors and answering questions are tour guides Jewel Fitzgerald (top second from right and bottom left), Christopher Summitt (bottom fourth from left) and Wes Bare (bottom right).

innovation," she says. "Boeing seems to always have something new that's right on the forefront. And being able to share that with the public from all over the world is amazing."

Most public tours are restricted to two balconies above the giant work bays. For safety, and to keep the factory productive and free of foreign object debris, most visitors can't set foot on the factory floor.

Last year, however, about 13,000 VIP visitors in small tour groups were able to walk the factory floor or scoot over it in golf carts. Those visits are led by VIP tour leaders, who are also Boeing employees. Wes Bare is one of them.

Unlike Summitt, with his casual clothes and jaunty cap, Bare sports closely cropped hair and wears a crisp collared shirt and dark blazer. His VIP tour groups can range from two guests to 50, frequently including top government officials, airline executives, federal aviation officials, or key suppliers and customers.

Bare's passion for aviation began when, at age 8, he took his first airplane ride. Later, while his teenage classmates studied for their driver's licenses, Bare focused on earning his pilot's license. He had it by age 17. Since then, he has flown a range of airplanes, from single-engine to 727-200.

That love of flying led Bare to a career at Boeing that now spans 25 years, beginning as a 747 industrial engineer. While he had been giving tours periodically since he came to Boeing, he became a full-time VIP tour guide several years ago. He says it's a job that fits him perfectly.

"Unlike automobiles, there are no big lots of new airplanes for people to go look at," Bare explains. "So this factory is like the showroom for our customers. Customers want to see their investment for sure, but they also want to see the people who build our planes and how organized and clean the factory is."

Leading a tour, Bare rattles off facts, figures and minute details with remarkable ease, ranging from the extent of wiring in a 747-8 (133 miles, or 214 kilometers) to the air pressure in each 777 tire (208 pounds per square inch, or 1,434 kilopascals).

Customer groups often stop for photos at their airplane-in-progress, and groups including pilots or flight attendants often spend extra time lingering around their future flight decks and crew rests.

Their individuality aside, all of Boeing's tour guides are highly knowledgeable, even passionate about Boeing. Their jobs are coveted—the most recent opening brought in 756 applications.

Summitt, the public tour guide, is a history buff. Working for a time at the Custer battlefield site in Montana, he learned how to speak to large audiences as a guide. There, too, he first grew the mutton chops that are his trademark today. He still volunteers in historical re-enactments and serves on the board of Mukilteo's Historical Society.

But it is as a tour guide at the Everett factory for the past four years that Summitt feels he's found his niche. And even though he may resemble the historical figures he re-enacts in his spare time, Summitt describes himself in less lofty terms.

"I am a cheerleader," he says. "And I am proud of that." ■

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Public tours of the Boeing Everett plant begin at the Future of Flight Aviation Center in Mukilteo, Wash. The tour opens with a six-minute film about Boeing and then visitors take a short bus ride to the nearby factory. Visit www.futureofflight.org/fof_Boeing.html for more information.

At your service

Service and support business is critical to military customers—and Boeing's global growth

By Robert Sterling and Juliette Yancey

Ground forces are pinned down, taking hostile fire from a pack of insurgents. In swoops a Boeing Apache attack helicopter. The pilot homes in on the insurgents, positions the aircraft and returns fire with pinpoint accuracy. The sound of explosions reverberates all around. The enemy retreats. And, for the time being, ground forces are safe.

Mission completed, the Apache pilot flies out of harm's way, lands and climbs out of the cockpit … to enjoy an ice cold soda in an air-conditioned building at the Boeing St. Louis site. He never actually left the ground.

The encounter with enemy forces was a simulated exercise in the Longbow Crew Trainer, an Apache simulator used for pilot training. The instructor, Rob Lenahan, is one of more than 16,000 Global Services & Support (GS&S) employees across the globe dedicated to delivering—in the office, in the factory, on military bases or even in combat zones—affordable support and sustainment of both Boeing and non-Boeing military aircraft, as well as a variety of other services.

At any time of the day or night, the global support team provides support services, such as training and simulation for the Apache, and numerous other military systems and government services. But the overall goal is to ensure that Boeing Defense, Space & Security products and systems, as well as some non-Boeing platforms, are maintained and supported. State-of-the-art training devices, which can be transported where the customer needs them, are just one of many products and services offered.

The support business provided by Global Services & Support is the second-largest business within BDS, with nearly 300 locations worldwide supporting 97 major programs and nearly 63,000 contracts and orders.

As a systems engineer for Training Systems and Government Services, one of three businesses that are part of the services and support organization, Lenahan's job is to understand all the systems aboard the Apache and ensure the Longbow Crew Trainer operates like the real thing.

"In the Apache, it's those split-second decisions that can save lives," Lenahan said. "So the trainer—which is what

Apache pilots eventually train on—needs to be authentic, as closely as possible replicating real-world scenarios."

Once Lenahan and his team are confident the Longbow Crew Trainers can do just that, the simulators are delivered to the U.S. Army for pilot training. Last year, the team set a record with the delivery of five simulators in a three-month span.

Lenahan's family has deep roots in the U.S. military, so he understands why Boeing's ongoing support for the military is so critical.

"My teammates and I feel a deep personal drive to support the customer for the long term," he said. "It's that support that means everything to the customer. I think of the people in the field, in battle zones, who are depending on the integrity of our aircraft. No one wants to let these guys down."

Alicia Raschke agrees. The first time she saw a C-17 military transport aircraft, she was awestruck. Still in her teens and a new recruit in the U.S. Air Force, she was sure of one thing—finding a way to work on this impressive aircraft that she knew played a big role for the military and on humanitarian missions.

"This thing was huge," Raschke said. "I wasn't sure if I'd ever learn everything I needed to know about the aircraft."

But learn she did. Trained in the Air Force's C-17 back shop, she became a machinist and, alongside Boeing field service representatives, learned how to make parts for the aircraft.

Today, 10 years later, Raschke is back

"I think of the people in the field, in battle zones, who are depending on the integrity of our aircraft. No one wants to let these guys down."

– Rob Lenahan, Systems Engineering manager, Training Systems and Government Services

PHOTO: Alicia Raschke, with the C-17 Maintenance & Modification team in Huntington Beach, Calif., discusses an upcoming modification with Art "Marty" Martinelli, the C-17 Maintenance & Modification lead representing the U.S. Air Force at Wright Patterson Air Force Base, Ohio. **PAUL PINNER/BOEING**

where she started. The only difference is that she has traded her blue Air Force suit for a Boeing badge. But her passion is just as strong. And her priority, now, is to deliver to the customer what she valued most when she was the customer.

Raschke and teammates in Huntington Beach, Calif., are part of Integrated Logistics, another of the three businesses within Global Services & Support. They help keep the Air Force's C-17 fleet operational. A scheduler and coordinator, Raschke works directly with the Air Force to ensure Boeing modification teams get to customer sites when needed to perform modification, upgrade, warranty and waiver work.

Raschke hasn't forgotten how, when she was on the customer side of the Air Force–Boeing team, Boeing service reps presented themselves.

"They reached out to us," she said. "They wanted our perspective. They valued our experience. Only after thoroughly listening to us did they offer advice. That left an indelible impression that inspires me to have that same customer service orientation now that I'm on the Boeing side of the team."

Pete Timmin knows something about that customer experience, too.

After spending 24 years in the military, Timmin, part of Maintenance, Modifications & Upgrades, said he knows his U.S. Air Force customer as well as he knows the platform he supports—the Boeing KC-135 tanker operated by the Air Force.

Timmin leads the Structures team in San Antonio, Texas, that performs maintenance on the KC-135, literally breaking down the four-engine jet to do inspections and modifications or skin and wing repairs. In service since the Eisenhower era, the KC-135 depends on the upkeep Boeing provides to perform its vital military missions.

"Our customers know that we put our hearts and souls into our work," Timmin said. "When they come to visit, there's a mutual respect; you see the trust in their faces."

That's the kind of customer recognition that brings a smile to Tony Parasida, president of Global Services & Support.

"Sometimes we think it's all about the airplane," Parasida said. "But it's not all about the airplane because without the passion of our people, without the

spares, without the technical know-how, without the trainers—or in simplest terms, without the upkeep—the system doesn't work. What our customers are looking for is the total package. And that's what GS&S is all about." ■

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PHOTO: With a KC-135 tanker in the background, Brig. Gen. Lee K. Levy II (in uniform at center right), director of Logistics, Headquarters Air Mobility Command, Scott Air Force Base, Ill., commends Boeing employees in San Antonio for their service and support work on the tanker and other defense programs. BOB WICKLEY

WORLDWIDE SUPPORT

Global Services & Support provides aircraft and non-aircraft support and products, including non-Boeing platforms such as the F-16 fighter. It comprises three major businesses: Maintenance, Modifications & Upgrades provides fleet support, upgrades and maintenance of aircraft; Training Systems and Government Services provides aircrew and maintenance training, as well as infrastructure and range services; Integrated Logistics is a leader in Performance-Based Logistics and weapons systems life-cycle support.

Plane majestic

The new 747-8 Intercontinental represents a huge leap in efficiency and passenger flying experience **By Bill Seil**

For more than four decades, the Boeing 747 has been an iconic airplane, loved by both travelers and those who admire it for its size and graceful beauty.

Now, the 747-8 Intercontinental is ready to carry on that proud tradition—and take the passenger experience to another level.

"They're going to have a great time flying in something they've never experienced before," predicted Bernie Ruhoff, Quality Improvement specialist with the 747 program.

While retaining many of the classic 747's popular features, including the unique "hump" behind the cockpit, the Intercontinental has been extensively redesigned, with a new wing, new engines and longer fuselage. Its overall performance has been significantly improved through the use of technology developed for the 787 Dreamliner. The interior also was redesigned to provide even greater passenger comfort.

"The 747-8 Intercontinental will give passengers everything they've always loved about the 747—its space, its comfort, its speed and more," said Elizabeth Lund, vice president and general manager, 747 Program. "We've taken some great interior elements developed for the Dreamliner and incorporated them

"It's amazing how something so large can, at the same time, be so elegant." **– Kirk Vining, engineering test pilot for 747 programs**

to create a stunning new passenger environment."

The first commercial Intercontinental was delivered to launch customer Lufthansa German Airlines on April 25. Lufthansa has ordered 20, with options to buy more.

Boeing also has sold nine of the planes to VIP customers, who install custom interiors.

Steve Taylor, president, Boeing Business Jets, said the 747 has long been popular among VIP customers, and the 747-8 Intercontinental is expected to build on that demand.

"When world leaders select their airplanes, the 747 is always their airplane of choice," Taylor said. "The elegance and versatility of the Intercontinental can only broaden that appeal."

The first deliveries of the 747-8 Intercontinental mark the end of a long development program, reminiscent of the mobilization that led to the creation of the original 747 in the 1960s.

"It's wonderful to see this airplane coming into service," Lund said. "Literally thousands of people have worked for years to design, build, test and certify the 747-8 Freighter and Intercontinental. It's been a long, difficult journey, but the end result is nothing short of incredible."

Although development of the 747-8 required an extensive redesign of the traditional 747 concept, pilots who have flown the 747-400 will feel right at home. New technology has been added to assist Intercontinental flight crews, but the configuration of the controls is essentially the same. Indeed, the training required to move from the 747-400 to the Intercontinental will be minimal, according to Kirk Vining, engineering test pilot for 747 programs. "Fly-by-wire" automation helps make the new airplane handle much like the earlier model.

"Flight crews will appreciate the effort that went into making the flight deck and handling characteristics very similar—if not identical—to the 747-400," Vining said. "They'll feel totally comfortable with this airplane."

The Intercontinental, he said, remains the "Queen of the Skies" with its familiar and majestic presence.

"It's amazing how something so large can, at the same time, be so elegant," he said. "To me, the beauty of the plane has just been enhanced by the modernization of its design."

His views are shared by many who worked on the airplane.

"I'm just in awe of the plane—I really am," said Mark Hale, 747-8 employee involvement coach and facilitator.

Her pride showing, Michelle Albert, 747-8 Interior Certification

PHOTOS: (Below) Lufthansa is the airline launch customer for the 747-8 Intercontinental, taking delivery of its first airplane April 24. GAIL HANUSA/BOEING **(Insets, from left)** Workers install Lufthansa's new business-class seats on the airline's first 747-8 Intercontinental. GAIL HANUSA/BOEING The completed business-class section of Lufthansa's new airplane; the Intercontinental includes a new purser station and a dramatic open stairway leading to the upper deck. PATRICK RODWELL/BOEING Boeing employees install the interior of the upper cabin. GAIL HANUSA/BOEING

lead, described it simply: "Lovely."

Depending on an airline's configuration, the Intercontinental has a seating capacity of 467 passengers in three-class configuration—51 more than the 747-400. It has more range than the 747-400, with overall operating costs reduced by about 10 percent, said Jim Haas, director of product marketing for Boeing Commercial Airplanes. Per seat, the fuel efficiency of the Intercontinental is 16 percent better than the 747-400, which means lower fuel use and a reduced carbon footprint per traveler, Haas said.

Upgrading to the Intercontinental will allow airlines to achieve higher profitability. Hass said economics of the 747-8 Intercontinental compare favorably with the other very large four-engine commercial airplane on the market: the Airbus A380, which seats about 525 in three-class configuration.

But it's a mistake to look on the Intercontinental and A380 as direct competitors, Haas said. As airlines retire their 747-400s, they can easily go up or down in size, depending on their business needs, within the Boeing line. Those that go down in size have the option of the popular 777-300ER (Extended Range). For those that want to go up in size, the 747-8 Intercontinental, with 51 more seats, has a number of cost, operational and environmental improvements over the 747-400, Haas said.

"The 747-8 also is a very quiet airplane," Haas said. It uses the same General Electric engines as the 787, but with a smaller fan. The chevron scalloping in the nacelles, along with other improvements, not only helps reduce engine noise but improves efficiency, he said.

The 747-8's new wing is 13 feet (4 meters) longer than the 747-400 from tip to tip and incorporates advanced technology airfoils inspired by the 787. New raked wingtips also improve efficiency.

Sales of the passenger version of the 747-8 have not been as strong as those of the Freighter version. In addition to Lufthansa and the VIP customers, Korean Air has ordered five.

But Haas said the Intercontinental was developed with the knowledge that demand for the freighter version would come first.

"When you look at the 747-400 replacement cycle, airlines typically start replacing airplanes when they're around 25 years old," Haas said. "So we're just getting into that 747-400 replacement cycle, and we've got the right products in place to meet that demand.

Commercial Airplanes' 2011 Current Market Outlook projects a market for 820 large (747-8 Intercontinental, A380) new airplanes, valued at $270 billion, through 2030.

In addition to demand from airlines, Boeing expects the 747-8 Intercontinental to be popular among passengers and build on the 747-400's award-winning reputation with frequent fliers.

Tarun Hazari, regional director, Passenger Experience and Airline Revenue, Commercial Airplanes Sales and Marketing, said the interior design concepts used in the 747-8 Intercontinental result from research and focus groups that took place prior to the launch of the 787 program.

"A combination of curved overhead architecture and special lighting creates that welcoming environment and a feeling of openness," Hazari said. "We've raised the bar and made traditional airplane interiors almost seem outdated."

The transformation of the 747 into the 747-8 was a challenge from a technological standpoint, as well as meeting customer expectations for the iconic airplane.

"While the 747-8 Intercontinental is really a new airplane, we recognized that there was a certain kind of experience and continuity that 747 travelers have come to expect," said David Okrent, 747-8 Brand manager. "We still have all of those popular spaces … quiet, relaxing places that make flying on a 747 a very special experience." ■

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PHOTOS: (Right) Even as Lufthansa's first 747-8 Intercontinental was being prepared for delivery, others were in various stages of construction inside the Everett, Wash., plant. PATRICK RODWELL/BOEING **(Insets, from left)** The 747-8 features a new and more efficient wing. GAIL HANUSA/BOEING The first-class cabin in Lufthansa's Intercontinental; the airline's second Intercontinental is prepared for painting; the Intercontinental includes all-new lighting and stow bins to enhance the passenger flying experience.
PATRICK RODWELL/BOEING




"We've raised the bar and made traditional airplane interiors almost seem outdated."

– Tarun Hazari, regional director, Passenger Experience and Airline Revenue, Commercial Airplanes Sales and Marketing

THE COLLIER MAKES THE DREAM EVEN SWEETER.

The Boeing 787 Dreamliner has won the 2011 Robert J. Collier Trophy, the aerospace industry's highest honor. On behalf of the men and women of Boeing and our partners around the world who poured their hearts into making this revolutionary airplane a reality, we're thrilled to receive this very special award.

BOEING

Higher order

Dreamliner order underscores long partnership between Boeing and Russia's Transaero Airlines

By Dmitry Krol

When Transaero Airlines concluded an order for four 787-8 Dreamliners high over Moscow recently, it was the first time a Boeing customer had signed a deal during a Dream Tour demonstration flight.

For Russia's largest privately owned airline, it was another in a significant trail of firsts.

Started in 1991, Transaero was the first private passenger airline in Russia, operating its first flight between Moscow and Tel Aviv, Israel, on a leased plane. Later it was first to introduce business class on routes within Russia. Then it was first in Russia with first-class service on domestic routes, first with full-service e-ticketing, and with online check-in.

It was also the first airline in Russia to introduce a Boeing jetliner to its fleet when, in 1993, it began operating a 737.

"Over the years, we have created the largest fleet of Boeing aircraft in Eastern Europe," said Olga Pleshakova, Transaero's general director. Now, the airline is turning to Boeing again—for the 787.

Pleshakova said they wanted the 787 because the airline is "committed to innovation."

The second-largest air carrier in Russia, Transaero ranks in the top 15 for safety among the world's 60 largest airlines. *Air Transport World*, an industry publication, announced in January that Transaero won its Airline Market Leadership Award for 2012.

Stretching across nine time zones from Europe to the Pacific Ocean and from North Asia to the Arctic Ocean, Russia is the largest country in the world by land area. Air travel often is the only way to get from one point to another within the country in reasonable time.

That means huge growth potential for travel, and Transaero is capitalizing on it.

In 2011, the airline carried more than 8.4 million passengers—a 27 percent increase over 2010—to more than 150 destinations in Russia, Europe, the Americas and Africa.

> "Our cooperation with Boeing is an important asset in maintaining the highest quality and safety standards that are so valued by our passengers."
>
> *– Olga Pleshakova, Transaero's general director*

Transaero operates the largest fleet of long-range, twin-aisle aircraft in Russia, the Commonwealth of Independent States and Eastern Europe. It has 78 Boeing airplanes, including 20 747s, 13 777s, 14 767s and 31 737s.

"Boeing and Transaero enjoy an almost two-decades-long partnership and we are opening a great new chapter together with the 787 Dreamliner," said Commercial Airplanes' Marty Bentrott, vice president of Sales for Middle East, Russia and Central Asia. "We look forward to working with Transaero to offer the airline's passengers the unprecedented comfort of the 787 Dreamliner and to our continued partnership with this great airline."

Pleshakova agrees.

"Our cooperation with Boeing," she said, "is an important asset in maintaining the highest quality and safety standards that are so valued by our passengers." ■

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PHOTOS: (Top) A Boeing 747-200 in the Transaero Airlines livery. **(Inset)** Olga Pleshakova, general director for Transaero. TRANSAERO


Argonne
Normandy
Midway
The Chosin Reservoir
Khe Sanh
Dak To
Medina Ridge
Tora Bora
Fallujah
These are the places we remember,
to honor the lives of those we'll never forget.
BOEING

In Focus

WILD BLUE YONDER

A Boeing B-52H bomber (left), with a B-2 stealth bomber on its wing, flies over Barksdale Air Force Base in Louisiana during its annual air show in April. The flyby celebrated the 60th anniversary of the first flight of the B-52 prototype in April 1952. Barksdale is home to the U.S. Air Force's 2nd Bomb Wing, which operates B-52s. For more about the B-52 and its storied history, see the Historical Perspective on Page 10. PHOTO: JENNIFER HOGAN/BOEING


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