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Frontiers

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NOVEMBER 2013 / Volume XII, Issue VII

CARRYING THE DREAM

With 787 production going up, the Large Cargo Freighter is a busy Dreamlifter


Every branch.
Every war.
Every story.
Today, we honor those who served
and those who serve.
For all they have given to the country,
we can never thank them enough.
BOEING
Thank
You

24 DREAM DELIVERY

It's big. It's unusual-looking. It turns heads. The Large Cargo Freighter, or Dreamlifter, is an essential player in the global production system for the 787 Dreamliner. A fleet of four is in the skies almost daily transporting wings, fuselage sections and other large assemblies of the 787 from Boeing partners to 787 final assembly sites in Everett, Wash., and North Charleston, S.C. With 787 production ramping up, these are busy times for the world's largest—by volume—cargo plane.

COVER: A DREAMLIFTER AT PAINE FIELD IN EVERETT, WASH. BOB FERGUSON/BOEING

PHOTO: ARRIVING FROM JAPAN, THE WINGS OF A 787-9 ARE UNLOADED FROM A DREAMLIFTER AT PAINE FIELD. BOB FERGUSON/BOEING

AD WATCH

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

Inside cover:

This ad was created to demonstrate Boeing's appreciation and gratitude to veterans and will run in *The Washington Post, The Seattle Times,* and more than 50 regional and trade papers. The campaign will also feature TV digital components and an online destination, Boeing.com/tribute.

Page 6:

The Soldiers' Stories ad promotes a new video series sponsored by the National Army Museum and presented by Boeing. The video series features personal recollections of soldiers' sacrifice and pride.

Pages 12–13:

This ad, from the "Partners Across Generations" campaign, highlights the relationship between Boeing and China's aviation industry. This remarkable partnership spans generations and is based on a shared commitment to safety, performance and excellence.

Back cover:

Featuring the P-8, the world's most capable maritime patrol aircraft, this new ad appears in global trade publications.

FSC LOGO

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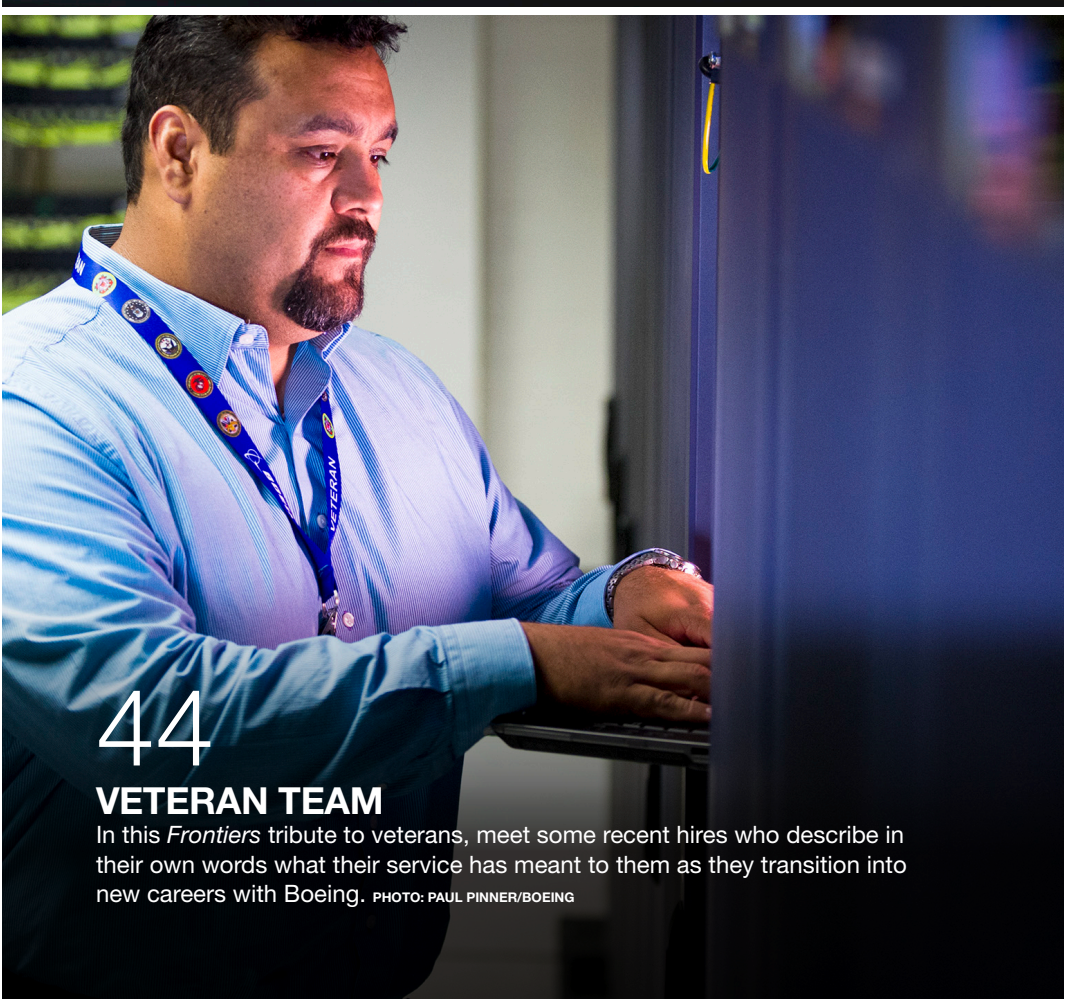

Inside

Every Soldier has a story to tell.

Introducing a new video series, featuring the personal recollections of ordinary men and women who have done extraordinary things for their fellow Soldiers, their Army, and the nation. Explore their stories at armyhistory.org.

Presented by BOEING

NATIONAL MUSEUM UNITED STATES ARMY

A Great Army Deserves a Great MUSEUM

Course for success

Everyone has a role in Boeing's future as an aerospace leader

Ray Conner
President and CEO,
Boeing Commercial Airplanes

Commercial Airplanes is in the innovation business, but our guiding principles are timeless: Put the customer first, set the bar for quality, and provide the best value in the marketplace. Unfortunately, those principles have been tested by recent challenges with our schedule and performance on development programs.

That's disappointing, for our customers and for our team. But we're working hard to turn it around and strengthen the reputation for value that has defined Boeing through nearly a century of aerospace leadership. We've been handed an incredible franchise by our founders and it's up to all of us to protect it and keep it alive.

Our value plan targets improvements in the areas that matter most to our customers: the quality, performance and reliability of our airplanes, coupled with on-time delivery and world-class customer support. These are the cornerstones of Boeing value. As the competitive environment grows more challenging, our ability to hit the mark in these areas will determine our very future as an aerospace leader.

In the next five years, commercial airplane customers will make purchase decisions worth $1.2 trillion. Those sales will determine who rules the market in the long term—Boeing or Airbus. Make no mistake, Airbus is a fierce competitor, working hard to push us to the sidelines. We can't let that happen.

So here's our plan: At Commercial Airplanes, we will redouble our efforts to design and produce the best airplanes in the world—efficiently, affordably and on time. We'll trim costs to achieve pricing flexibility today and fund the innovations of tomorrow. And we'll grow our services, to better support customers throughout the life of the airplane. We'll compete hard, but we won't sacrifice quality, safety or value. We helped pioneer this industry, and the world looks to us to set the standard.

Providing traditional Boeing value for less won't be easy, but our strategic plan charts the course for success. It's especially important that we improve our design-and-build quality and reduce mistakes that lead to expensive and time-consuming rework.

That's true for all of us, whether we work directly with the airplanes or support the business in other ways. Everyone has a role.

Our ability to draw from talent and resources across Boeing is a huge advantage. We see that every day in our successful collaboration with Boeing Defense, Space & Security on the KC-46 Tanker program, in our work with suppliers and on efforts to improve safety across the enterprise.

The progress we've made with Lean+, Partnering for Success, Go for Zero and other initiatives is moving us in the right direction, but we have more work to do. I'm asking everyone to make this personal and make your own mark, because we're all in it together.

I've been part of Commercial Airplanes for more than 35 years—working on the factory floor, in the sales office and on our airplane programs. I've seen what our team can do. No one is better at solving tough problems, finding a path forward and revolutionizing the world of flight. We are guardians of a proud legacy.

Working together, we will meet this challenge and secure our long-term future as aerospace leaders.

That's who we are. We are Boeing. ■

PHOTO: BOB FERGUSON/BOEING

"I'm committed to ensuring the safety of our aircraft and especially of the people who fly on them."

– Stephanie Lee

Something in the air

This wind-tunnel engineer has front-row seat to what comes next in aerospace

By Kate Zaranek and photo by Fred Troilo

Stephanie Lee is a data engineer at the Boeing vertical/short takeoff and landing wind tunnel at the company's site in Ridley Township, Pa., near Philadelphia. In this Frontiers *series that profiles employees talking about their jobs, Lee describes how she came to Boeing and why her role in Boeing Test & Evaluation is important to her—as well as the company.*

I work in one of the most interesting places you'll find at Boeing. It's the largest privately owned wind tunnel in the country, and it has a nine-blade fan that's 39 feet (12 meters) in diameter that can generate up to 18,000 horsepower and speeds greater than 220 knots (250 mph, or 400 kilometers per hour).

We test a variety of objects here, and I am responsible for writing custom software to collect data from the tests—aerodata such as pressure, force and moment, all of which determine how an aircraft will act in flight. The data I produce provide critical engineering information about these aircraft. Boeing programs use the data to improve a design or test a concept.

Working with a wide range of products and people at the wind tunnel, I have a front-row look at different aerospace products and concepts and I learn from people with different perspectives. It's fascinating to get a sneak preview of the future of aerospace.

Everyone on the team is cross-trained and willing to step in to assist others. I've had the opportunity to learn to operate the tunnel, support instrumentation setup and serve as a test engineer. I have traveled to different labs throughout our organization and seen how easily we all work together and collaborate. During an off-site wind-tunnel testing assignment, I got to experience the customer side of wind-tunnel testing and brought back valuable lessons learned from another facility. From all of these different experiences I've really developed technically as an engineer and I've seen our team come together more tightly. Indeed, my team has become like a second family.

I became interested in aerospace back in high school. I was at a camp the summer after my junior year and I saw a demonstration from a senior researcher from NASA Ames Research Center in California. He brought in a miniature wind tunnel and showed how air flows over a surface to create lift. More important, he brought a team of interns with him who were about my age. I thought, I could be one of them.

Right then and there, I knew I was hooked on wanting to work in aerospace. I was so excited after the session that I asked the researcher if I could help his team. Eventually, I got internships at Boeing as a college student and I joined the company full time in 2012.

My goal is to be a test director. They have the "big picture" view of a test and are responsible for all operations, much like an orchestra conductor. They make sure everyone is working in sync.

Meanwhile, I feel very lucky to be part of a really dynamic group with a great team atmosphere. The work is exciting and interesting. It is also meaningful because we contribute to something very important—the safety and performance of our products. I'm committed to ensuring the safety of our aircraft and especially of the people who fly on them. It's a huge responsibility that I take very seriously because I know what I do helps unite families and bring people home. ■

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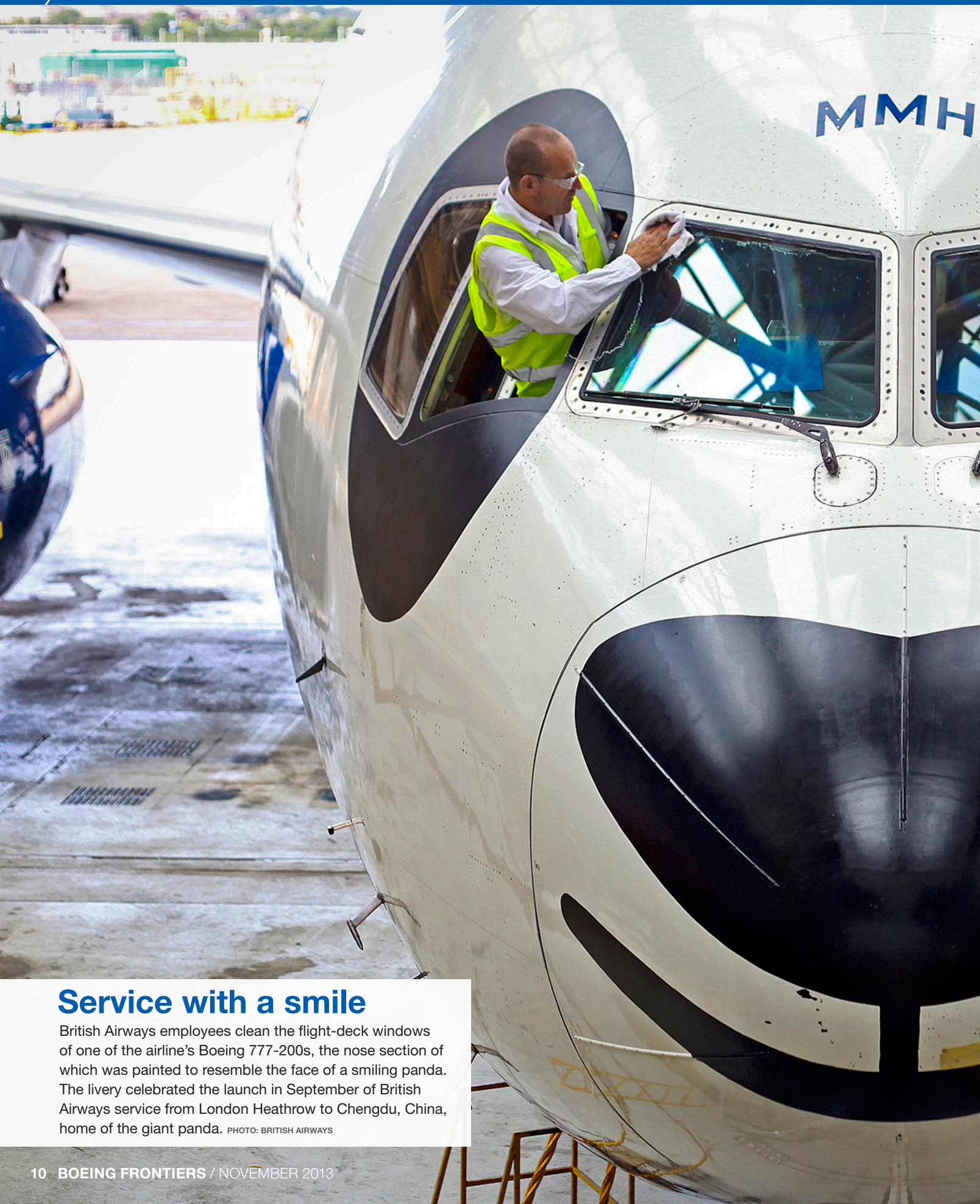

Service with a smile

British Airways employees clean the flight-deck windows of one of the airline's Boeing 777-200s, the nose section of which was painted to resemble the face of a smiling panda. The livery celebrated the launch in September of British Airways service from London Heathrow to Chengdu, China, home of the giant panda. PHOTO: BRITISH AIRWAYS

"It was a little different to see an F-16 take off without anyone in it."

– *Lt. Col. Ryan Inman, commander, 82nd Aerial Targets Squadron at Tyndall Air Force Base near Panama City, Fla., talking about the first flight of the QF-16, which took off from the base, performed supersonic tests and then landed—all without a pilot in the cockpit. Boeing has modified six F-16s to be used as unmanned aerial targets for pilots training in air-to-air combat.* Boeing News Now, *Sept. 23*

"It's going to result in an awesome airplane."

– *Darren Veneman, U.S. Air Force KC-46A maintenance planning lead, after experiencing Boeing's KC-46 tanker demonstrator. It is on a road-show tour to give aircrews, maintenance personnel, politicians and others an opportunity to learn about the new tanker, its advanced technologies, and how it will benefit warfighters.* Boeing News Now, *Oct. 10*

"The premier said to me when we arrived my wrinkles had gone."

– *Qantas chief Alan Joyce, speaking to media and others in Melbourne, Australia, after a flight from Everett, Wash., with a stopover in Honolulu, on the first 787 Dreamliner for Qantas low-cost subsidiary Jetstar. Among its advanced features, the 787 cabin has higher humidity to make passengers more comfortable on long-haul flights. Associated Press, Oct. 11*


BOEING
波音

飞越时代的伙伴

他，是中国首批波音机长，几十年的职业生涯，在无数次的起降与翱翔中，亲历着中国民航的起步与腾飞。他，继承父亲对蓝天的热爱，成为波音最新的 787 梦想飞机机长。两代人传承着共同的血脉与理想，也见证着波音与中国民航业的共同发展。这份飞越时代的伙伴关系，立足于彼此尊重和互惠共赢，秉承对安全，性能和卓越表现的不变承诺，令我们不断成就非凡，飞向未来！

PHOTO: JIM ANDERSON/BOEING

Making the right choice

Advantage+ health care plan is again an option in 2014

By Karen Lareau and Susan D'Alexander

A year ago, Kelly Wright, a Boeing Human Resources manager in Washington state, was like many other employees who were trying to better understand which Boeing health care plan would be best for them and their families in 2013.

Wright, a 15-year Boeing veteran and mother of two, took her time exploring all of her options and decided to go with Boeing's new Advantage+ health plan.

As part of this plan, Boeing contributes to a separate health savings account for eligible employees. When Wright needed surgery, she had the flexibility to increase her own pretax contributions to her health savings account in advance, and used tax-free money to pay the medical bills.

"With the funds I had accumulated in my health savings account, I was able to pay my portion of the cost for the surgery, with money still left over," she said.

Wright is among about 22,000 Boeing employees, or nearly 25 percent of the company's nonunion workforce, who received medical benefits through the new Advantage+ health plan in 2013. This month during annual enrollment, which runs from Nov. 8 through Dec. 3, employees will be asked to choose their medical benefits for 2014. The Advantage+ health plan is again among the choices for many employees. (To confirm eligibility, call TotalAccess at 866-473-2016.)

The plan was introduced in 2013 to offer a new option that would meet the needs of a wide range of employees and also help them save for future medical expenses, according to Tony Parasida,

senior vice president of Human Resources and Administration.

"Misconceptions about this new plan may be causing some to overlook the potential benefits," Parasida said. "The plan does have a higher deductible, but that should not cause employees to reject it out of hand."

Parasida explained that the deductible is offset by several factors, including a lower paycheck contribution and, for eligible employees, Boeing contributions to a separate tax-advantaged health savings account that can be used to pay current or future medical expenses. Employees own their health savings account and can take it with them when they leave Boeing for any reason.

Fumito Kobayashi, a Boeing Defense, Space & Security electrical engineer in Huntington Beach, Calif., also opted for the Advantage+ health plan in 2013, in large part because of the health savings account. While his medical costs are typically low, he likes having money in his health savings account for possible medical expenses.

"My plan," Kobayashi said, "is to contribute as much as I can afford to my health savings account and let it grow tax-free. Then, I'll have a larger nest egg to draw from for medical-related expenses in the years to come."

Eligible employees can also add their own pretax contributions to the health savings account, up to federal limits.

Almost one year in, according to Boeing, analysis of medical claims data shows that about 70 percent of eligible employees would have saved at least $500 or more in out-of-pocket expenses in 2013 with the Advantage+ health plan than their current plan, and nearly half of eligible employees would have saved $1,000 or more had they selected the Advantage+ health plan.

Employees should compare plans during enrollment and decide the best option for them and their families, Parasida said. Kobayashi and Wright plan to stay with the Advantage+ health plan in 2014.

"I've been happy with the services. I've been really pleased," Wright said. "I've found it to be an effective way to maintain health care coverage and save for the future." ■

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PHOTO: BOB FERGUSON/BOEING


FlexTech

MAXIMIZING PRODUCTION

How the new 737 MAX will be assembled in a factory already humming with production

By Lauren Penning and photos by Bob Ferguson

Doug Rigsby, a mechanic on the 737 program, will be one of the first to build the new 737 MAX when it enters production in 2015. He's looking forward to the day when the MAX flies through the factory as efficiently as it will soar through the sky.

But first comes the learning curve—and a lot of problem-solving for the 737 factory in Renton, Wash.

"There is going to be an evolution," Rigsby said. "The key is to do everything right the first time."

Rigsby is part of a team of industrial engineers, manufacturing engineers, mechanics and specialists from across Boeing who are working out the logistical details of how to move the MAX into production.

They face an unusual conundrum: how to introduce a new airplane into a humming factory that is already producing at record rates. When the 737 MAX begins final assembly, the Renton factory will be building 42 airplanes a month.

The prospect is a bit like introducing a slow car into the fast lane of traffic, according to Chip Roberts, Industrial Engineering team leader for the 737 MAX.

"With the first MAXs you'll have mechanics measuring twice and drilling once because it's a brand-new airplane," Roberts said. Introducing a new model into that system could slow things down considerably.

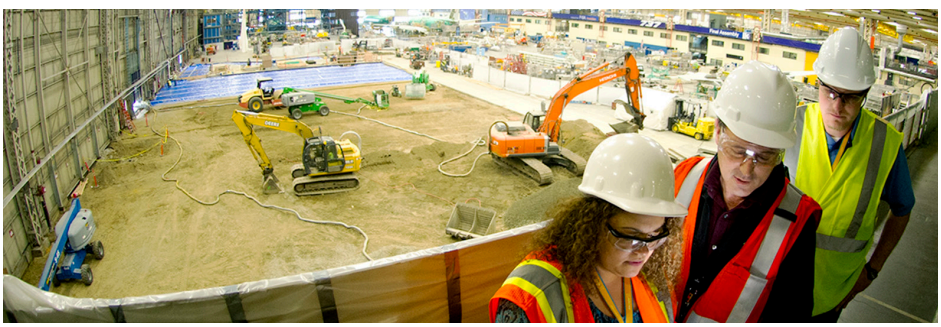
To avoid a pileup, the planning team decided not to introduce the MAX into the Next-Generation 737 production stream right away. Instead, they opted to build a temporary final assembly line just for the MAX, allowing any issues on the new airplane to be worked out without slowing the factory's production.

This will ensure that "with the first final assembly of MAX, we won't get in the way of the fast lane," Roberts said.

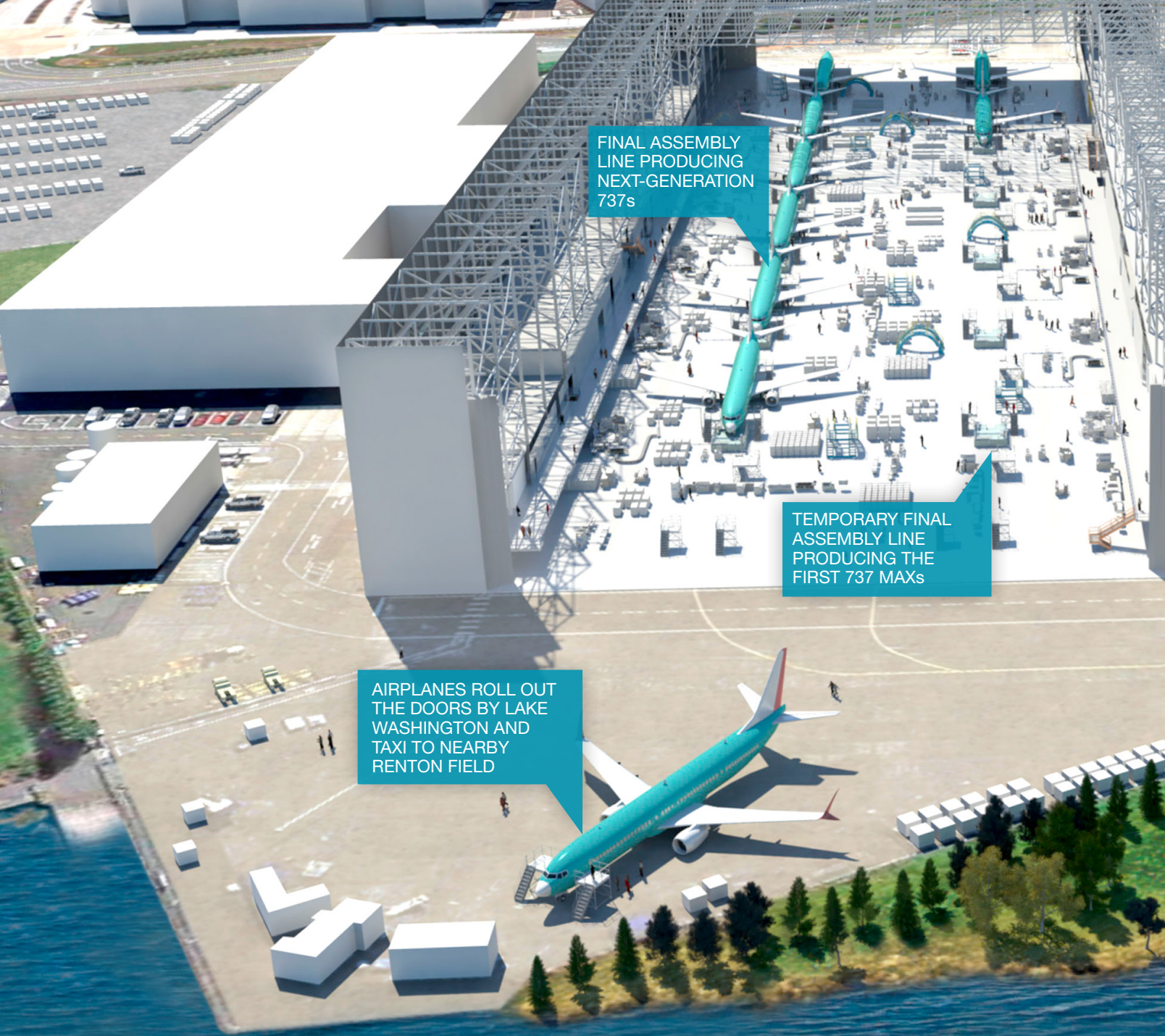
Marty Chamberlin, Manufacturing and Operations leader for the 737 MAX, said the concept of a temporary final assembly line just for the MAX "turned on a light" for how it would be systematically introduced into the Renton factory.

The plan calls for the most-experienced mechanics, such as Rigsby, to shift onto the temporary MAX line, learn the procedures, and then train the rest of the factory, even as Next-Generation 737s

> "Having the efficiencies gained from the moving line already built-in will really help."
>
> *– Doug Rigsby, 737 mechanic*



PHOTOS: (Far left) Industrial engineer Chip Roberts looks on as 737 mechanic Sophea Pel installs wiring on the Next-Generation 737. (Left) Glynis Pacheco, from left, 737 industrial engineer, and Site Services project administrators Neil Haines and Dan Selthofer review plans at the construction site in the 737 wings building, which is now the new location for 737 Wings Systems Installation.



continue to roll out at full production.

This training plan will allow employees to quickly ramp up production of the MAX while leveraging the efficiencies gained from the moving line concept, which in 2002 transformed the way Boeing builds 737s, Rigsby explained.

"With the introduction of the Next-Generation 737 we basically mirrored what we did on the 737 Classic," said Rigsby, who has been with the program since the first Next-Generation 737 was produced 17 years ago.

At that time, 737s were assembled start-to-finish in one spot, all of them parked side by side at a slant facing the factory wall. The moving line concept that is applied today streamlined Next-Generation 737 production, reducing build time from 28 days to 11.

"Having the efficiencies gained from the moving line already built-in will really help," Rigsby said, "because the quicker we get fast at the build, the more likely we'll be a success on the MAX."

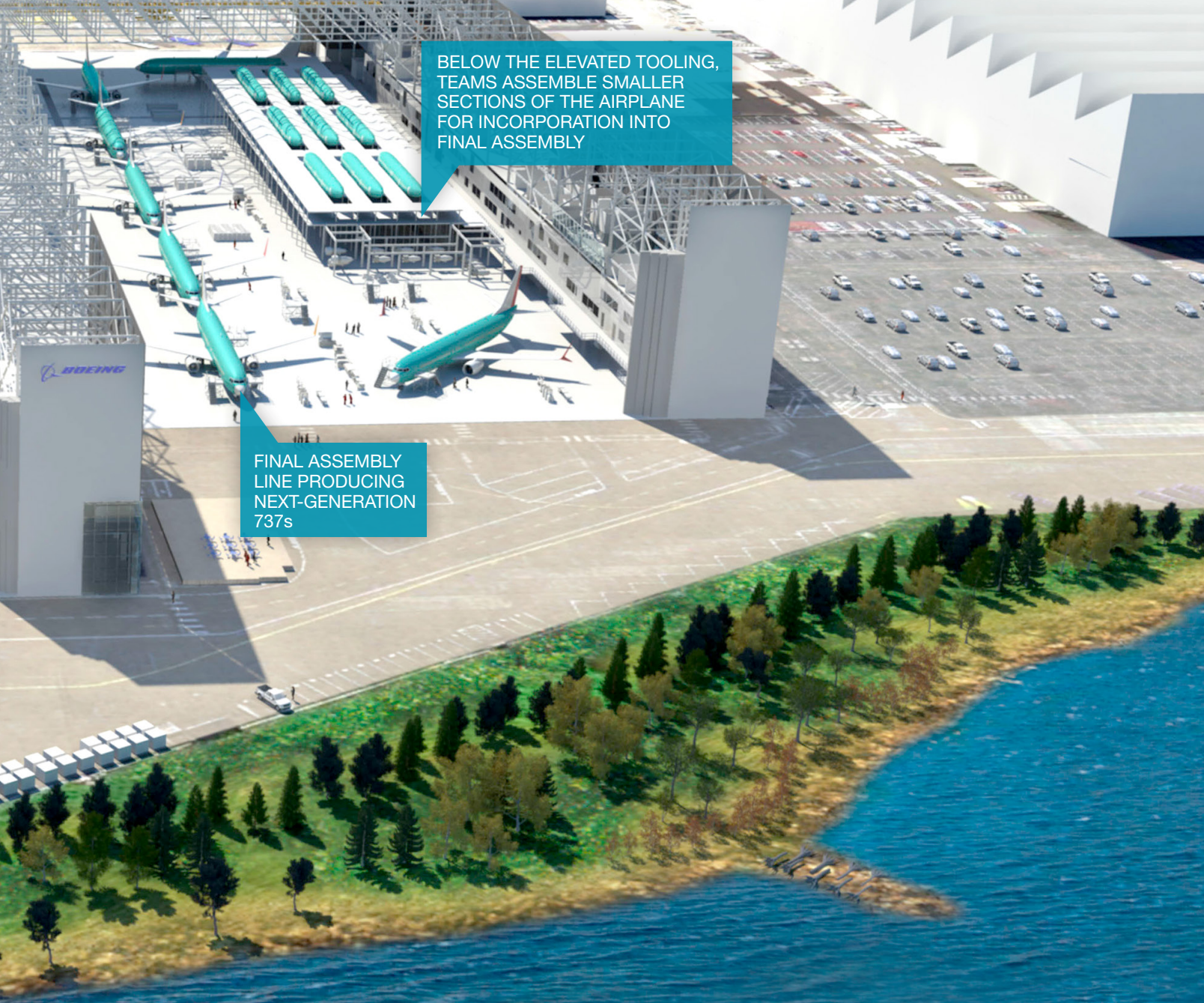
Despite its advantages, the plan to add a temporary production line for the MAX introduced a new challenge: how to make room for it in the final assembly buildings in Renton, where tooling, parts and active production fill most of the space.

Something had to go, said Glynis Pacheco, a 737 industrial engineer who helps manage the construction projects in the factory.

"When we first started, we didn't have space" to work with, Pacheco said. "We looked at all the options. Then we used facts and data to choose."

Within the wings building, the team identified a storage area for fasteners and rivets that could be relocated, providing space to consolidate all of the 737 wing work into one building. That's all they needed to start things moving.

Then, in late August, 737 Wings Systems Installation was shifted into the



former storage area. That, in turn, freed up space to build two elevated fuselage systems installation tools, consolidating installation work that now is performed in two locations within the factory.

In the bays below the elevated tooling, teams will assemble smaller sections of the airplane such as the empennage, a part of the tail assembly.

Once completed, in 2015, this complex series of maneuvers will provide the space to install the 737 MAX temporary production line.

Erik Nelson, director of 737 Manufacturing and Operations, likened it to a big tile game—the puzzle where only one space is open to shift tiles into place: "You move one piece and then move the next and finally you move the tile you were really focused on."

Once MAX production is up to speed on the temporary line and everyone is trained, it will move into the mainstream of Next-Generation 737 production.

This aggressive plan for the MAX is possible because of the early engagement of all the key players, and the diversity of the team, according to Roberts.

"We have people who are brand-new to Boeing and bring the energy and imagination of people who haven't had to think inside the box for too long," he said. "And then we have experienced people who know how it works in there. It's a very helpful environment." ■

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GRAPHIC: An artist's concept of the 737 Renton, Wash., factory in 2015 when the MAX first enters production. Once the MAX production process has been proved, the program will build Next-Generation 737s and 737 MAXs on the same production lines. BRPH

FLYING INTO THE FUTURE

These Boeing ‘airplanes’ never leave the ground, but the passenger experience is invaluable

By Elizabeth Bieri and photos by Bob Ferguson

With boarding passes in hand, passengers crowded the entrance to the cabin as a flight attendant welcomed them aboard the twin-aisle "airplane." The duration of their flight would be short—just 20 minutes—and their cruising speed would be zero. Even so, these passengers were about to fly into the great unknown—the future of Boeing airplane cabin design.

This was a recent focus group at the Passenger Experience Research Center, a customizable airplane mock-up at the Future of Flight visitor center in Everett, Wash. Known as the PERC by those who work with it, the center is located just across the runway from Boeing's Everett twin-aisle factory.

It was created 10 years ago to field test concepts for cabin design and help determine whether they should be turned into reality. The cabin mock-up can be reconfigured to test a wide range of theories about passenger preference and allows members of the flying public to answer survey questions while in the cabin.

Linda Tabor of Fredericksburg, Texas, who frequently travels to Central America to participate in medical missions, said she took part in the focus group because she was intrigued by the center's name, and its mission.

"I was curious to know the changes that might be coming in airplane interiors in the future," Tabor said. "I appreciated that the survey had lots of questions, but I especially liked that there was a place for comments and what I, as a passenger, would like to see in an airplane interior in the future."

Although study participants won't see immediate changes in cabin interiors, their impact on design decisions is substantial, according to Blake Emery, director of PERC and Differentiation Strategy for Boeing Commercial Airplanes.

Each year thousands of people of all ages, from all parts

"The data collected at PERC is valuable, because it allows us to scientifically validate ideas. It allows consumers to influence our product design."

– Blake Emery, director of PERC and Differentiation Strategy for Boeing Commercial Airplanes

PHOTOS: Thousands of visitors take part in studies at the Passenger Experience Research Center, mainly in the peak visitor season of late spring to early fall. Teague, a global design consulting firm, conducts the studies, designed by Boeing researchers. (Clockwise from top left) Two young visitors earn their wings; "flight attendant" Charlene Bailey, a PERC administrator, hands out electronic survey-response devices; PERC administrator Yvette Kelp greets incoming "passengers"; visitors assess a mock-up of an airplane interior.

GRAPHICS: SHUTTERSTOCK

“The survey had lots of questions, but I especially liked that there was a place for comments and what I, as a passenger, would like to see in an airplane interior in the future.”

– Linda Tabor, a visitor from Fredericksburg, Texas, who participated in a focus group at the Passenger Experience Research Center in Everett, Wash.

of the world, take part in PERC studies, providing a diverse data set for a truly global product. The PERC team engages participants from the flying public to test ideas generated by the team's wide-ranging research into the passenger experience, Emery explained.

"The data collected at PERC is valuable, because it allows us to scientifically validate ideas," Emery said. "It allows consumers to influence our product design."

Survey questions administered and scored through electronic hand-held devices help Emery's team quantify those elusive details: How's the lighting? Are windows the right size and well-located? Are the stow bins easy to use?

Sometimes the most useful participant feedback is negative, alerting the team to ideas that would not be popular with the flying public if they made their way into a future cabin interior.

"PERC provides a vehicle for us to change the way we think about standard features like a window or reading light, and re-design them and incorporate them in an airplane cabin in a way that enhances a passenger's flying experience," Emery said.

The innovative cabin design of the 787 Dreamliner is a reflection of that research. The Dreamliner features stow bins that curve upward, providing a sense of openness for the passengers seated underneath. Larger windows and new LED lighting that simulates the sky are intended to create a more open and relaxed feel throughout the cabin, improving the passenger experience, Emery explained.

The Dreamliner interior has been so well received by the flying public that many of its features are now bundled into a package known as the Boeing Sky Interior. It's an available option on the Next-Generation 737—more than 500 NGs outfitted with the special interior have been delivered to date—and it will be the standard cabin interior on the 737 MAX.

With the success of the 787 Dreamliner behind it, the PERC team is now focused on the challenge ahead: using the upcoming 777X as an opportunity to take commercial airplane interiors to the next level.

At the PERC, it's not enough just to build off of past success.

"Any time you are going to have a true breakthrough, you can't just take what you have and try to make it better," Emery said. "You pretty much have to start from a clean sheet of paper." ■

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PHOTO: (Top middle) PERC administrator Austin Trevino explains to visitors what to expect during a focus group.

GRAPHICS: SHUTTERSTOCK

THE BI

G LIFT

Four Large Cargo Freighters are key players on the Dream team

By James Wallace and photos by Bob Ferguson

The Large Cargo Freighter, also known as the Dreamlifter, is the primary means of transporting the wings, fuselage sections and other major assemblies of the 787 Dreamliner from Boeing's global partners to the 787 final assembly sites in Everett, Wash., and North Charleston, S.C. As 787 production increases, the four Dreamlifters in the fleet are crisscrossing the skies day and night—crucial players on Boeing's Dream team. Recently, Boeing photographer Bob Ferguson captured what happens when a Large Cargo Freighter arrives in Everett with its valuable cargo. In this case, it carried the composite wings for the new 787-9. The wings for the 787-8 and 787-9 are manufactured by Mitsubishi Heavy Industries in Nagoya, Japan.

During a luncheon at Seattle's Museum of Flight several years ago, Boeing's first Large Cargo Freighter, then in flight testing, taxied by. The museum borders the runways of Boeing Field.

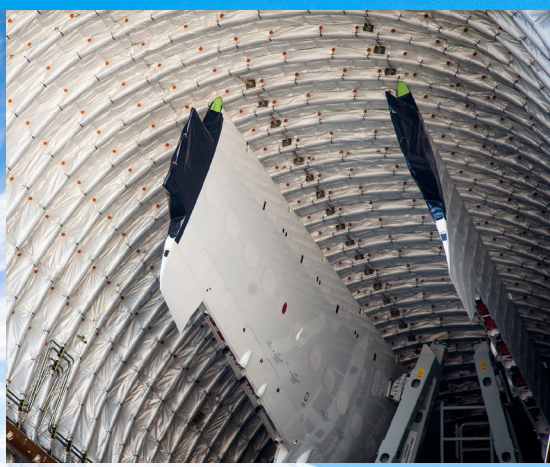
A Commercial Airplanes executive was giving the keynote speech, and in the audience was Joe Sutter, chief engineer for the original 747 program, who is often referred to as the "father" of the first jumbo jet.

As all eyes turned to the conference room windows where a gargantuan airplane with bulging fuselage was slowly making its way past, the executive quipped: "Sorry, Joe, for what we did to your airplane."

The 747 that Sutter and his team of "Incredibles" designed and built in the late

PHOTOS: (Left) The nose of a Large Cargo Freighter. (Inset) A specially designed cargo loader removes nearly 100-foot-long (30-meter) 787-9 wings from the Dreamlifter.

The world's longest cargo loader vehicle, measuring just over 110 feet (34 meters), with 32 tires, was built to move 787 wings and fuselage sections on and off the plane.



PHOTOS: (Below) The Dreamlifter has a volume of 65,000 cubic feet (1,840 cubic meters) of cargo space. (Insets) The plane was designed to allow easy loading and unloading of large 787 fuselage and wing assemblies.

1960s is an icon of aviation, one of the most recognized and photographed of all commercial jets, beloved by generations of passengers for its beauty and majesty in the sky and for the flying experience it provides.

Born of the 747, the Large Cargo Freighter also turns heads—for its sheer size and unusual appearance. The highly modified, secondhand 747-400 passenger plane can haul more cargo by volume than any airplane in the world. The first one made its first flight in 2006 and was certified to return to service in 2007 to support final assembly of the first Dreamliners. A total of four were built.

Although beauty may be in the eyes of the beholder, few would probably call the Large Cargo Freighter beautiful, regardless of its 747 lineage. But it is certainly impressive. The upper deck of its massive cargo bay has a volume of 65,000 cubic feet (1,840 cubic meters). That's more than three times the cargo

(Continued on Page 31)


DREAMLIFTER
DREAMLIFTER

BIG AND **BIGGER**

747-400 FREIGHTER

LENGTH: 231 feet 10 inches (70.6 meters)

WINGSPAN: 211 feet 5 inches (64.4 meters)

FUSELAGE WIDTH:
21 feet 4 inches (6.5 meters)

HEIGHT (tip of vertical fin):
63 feet 8 inches (19.5 meters)

MAIN DECK CARGO CAPACITY:
21,347 cubic feet (605 cubic meters)

DREAMLIFTER

LENGTH: 235 feet 2 inches (71.7 meters)

WINGSPAN: 208 feet 11 inches (63.4 meters)

FUSELAGE WIDTH:
27 feet 6 inches (8.4 meters)

HEIGHT (tip of vertical fin):
70 feet 8 inches (21.6 meters)

MAIN DECK CARGO CAPACITY:
65,000 cubic feet (1,840 cubic meters)

PHOTO: A Dreamlifter arrives at Paine Field in Everett, Wash., with its valuable cargo—assemblies for the 787. Another Dreamlifter can be seen in the background.


DREAMLIFTER

capacity of the upper deck of the 747-400 Freighter. Boeing once calculated that a Large Cargo Freighter could hold 42 million pingpong balls, or 8 million 12-ounce (0.35-liter) cans of soda, or 80 Mini Cooper sports cars … or even a three-level, 10-lane bowling alley with room to spare for a restaurant.

Of course, what the four Large Cargo Freighters do carry are the wings and fuselage sections, along with other large assemblies such as the horizontal stabilizer, needed for final assembly of 787s in Everett and North Charleston. They arrive at both sites from Italy and Japan, and from Wichita, Kan., where the forward fuselage of the 787 is manufactured. They also carry the aft- and mid-body 787 fuselage sections made by employees at the Boeing South Carolina site to the Everett factory.

With 787 production scheduled to hit 10 planes a month by early 2014, the four Large Cargo Freighters are putting in some long days. As of August this year, they averaged 100 flights per month and approximately 600 flight-hours, according to Boeing. The planes are expected to average about 160 flights per month to support the higher 787 production.

To accommodate those 787 assemblies, and to make loading easier, the Large Cargo Freighter was designed with a tail that swings open. The swinging portion of the plane's tail weighs about 44,000 pounds (20,000 kilograms), or as much as a fully loaded World War II Boeing B-17 bomber.

The Large Cargo Freighter is big enough to transport one set of 787 wings, each wing nearly 100 feet (30 meters) long.

The world's longest cargo loader, measuring 110 feet (34 meters), with 32 tires, was built to move the 787 wings and fuselage sections on and off the plane.

But those are only numbers that underscore just how big the Large Cargo Freighter actually is. Given the appearance and size, it's easy to forget what this unique airplane carries inside—why it's called the Dreamlifter. ■

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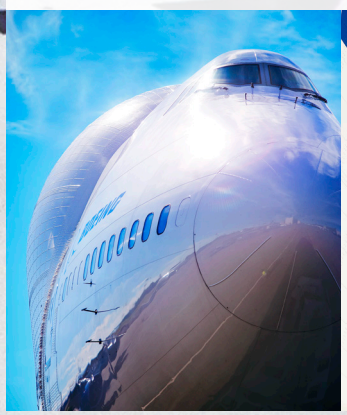
For more about the Large Cargo Freighter, see the June 2005 and November 2006 stories in Frontiers.

PHOTOS: (Left) The second Boeing 747-400 Dreamlifter on its first flight in February 2007 in Taipei, Taiwan. BOEING (Inset, far right) Ground crew members prepare to open the swing tail of the Dreamlifter at Paine Field in Everett, Wash.



WAVES OF INNOVATION

Huntington Beach site has storied history, but employees are focused on the future

By Diane Stratman and photos by Bob Ferguson

Huntington Beach, Calif., is a place where a mild and mellow beach culture perseveres, where pretentiousness takes a back seat to cool and casual. But it's also the place where Boeing has designed and built world-changing aerospace products and services for more than 50 years. The site continues to make its mark today, developing a broad range of advanced technologies.

On many early mornings at Southern California's Huntington Beach, whether the skies are clear and bright or gray and foggy, Boeing engineer Eric Brown and hundreds of other surfers line up like sentries on the sand to scope the ocean waves along the south side of its famous pier. Known as Surf City USA, the city draws novice, seasoned and champion surfers to practice, compete or just catch a wave. Brown is among the seasoned, having surfed since he moved to Southern California 29 years ago to work at Boeing.

"There's nothing like it … hitting the waves before most people are awake," Brown said. "It's a great way to get energized for the day."

Just a few miles inland, feats of another sort have earned honor and

PHOTOS: (Left) Waves break near the famous Huntington Beach pier. (Above and right) Lance Fluger, left, software engineer, and Kevin Jenkins, mechanical systems engineer, discuss ways to improve their designs using gesture-based 3D model interaction tools in the Boeing Huntington Beach Innovation Cell.

esteem in the aerospace world for more than 50 years at the Boeing Huntington Beach site. That's where Brown works as a senior manager of the Advanced Concepts team in Boeing Research & Technology. From this sprawling 187-acre (76-hectare) campus, rocket scientists, engineers and technicians from Boeing and its heritage companies have played major roles in the development of America's most important space vehicles and platforms, including the Apollo spacecraft that took astronauts to the moon, the International Space Station, NASA's space shuttles and the family of Delta rockets that has launched into orbit hundreds of commercial and military satellites.

Today, Huntington Beach is one of the largest Boeing Defense, Space & Security sites in the United States. The work now being performed there is of a different nature than that in the space-race heyday of its past, but innovation plays as big a role as ever.

"The site is one of Boeing's most diverse and innovative facilities, with employees working on a broad range of advanced technologies in the areas of space, intelligence, unmanned systems, cybersecurity, and C4ISR (command, control, communications, computers, and intelligence, surveillance and reconnaissance)," said Alex Lopez, Huntington Beach site executive and vice president of Advanced Network & Space Systems.

"It's hard to find a more diverse and sophisticated talent base," he said. "It's a place where engineering students are eager to get their foot in the door because of the many opportunities to learn from seasoned engineers across a wide spectrum of disciplines."

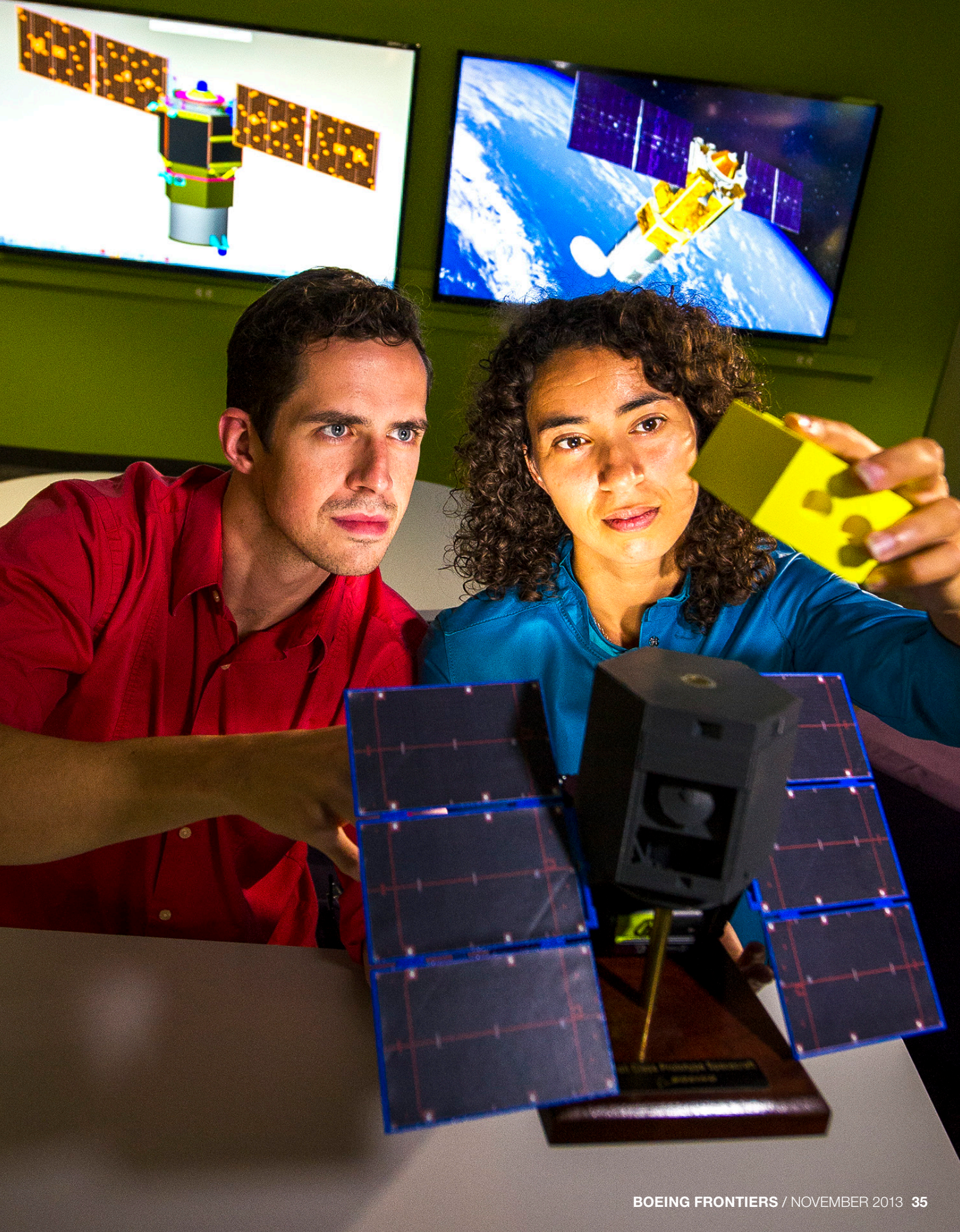
One of those disciplines is satellites, but not the huge, multi-ton satellites Boeing manufactures at a neighboring Boeing factory in El Segundo, Calif. A Phantom Works team at the Huntington Beach site recently prototyped the Phantom Phoenix family of small satellites that addresses a promising market for smaller, more flexible and affordable satellites for a variety of missions from intelligence, surveillance and reconnaissance to weather observation.

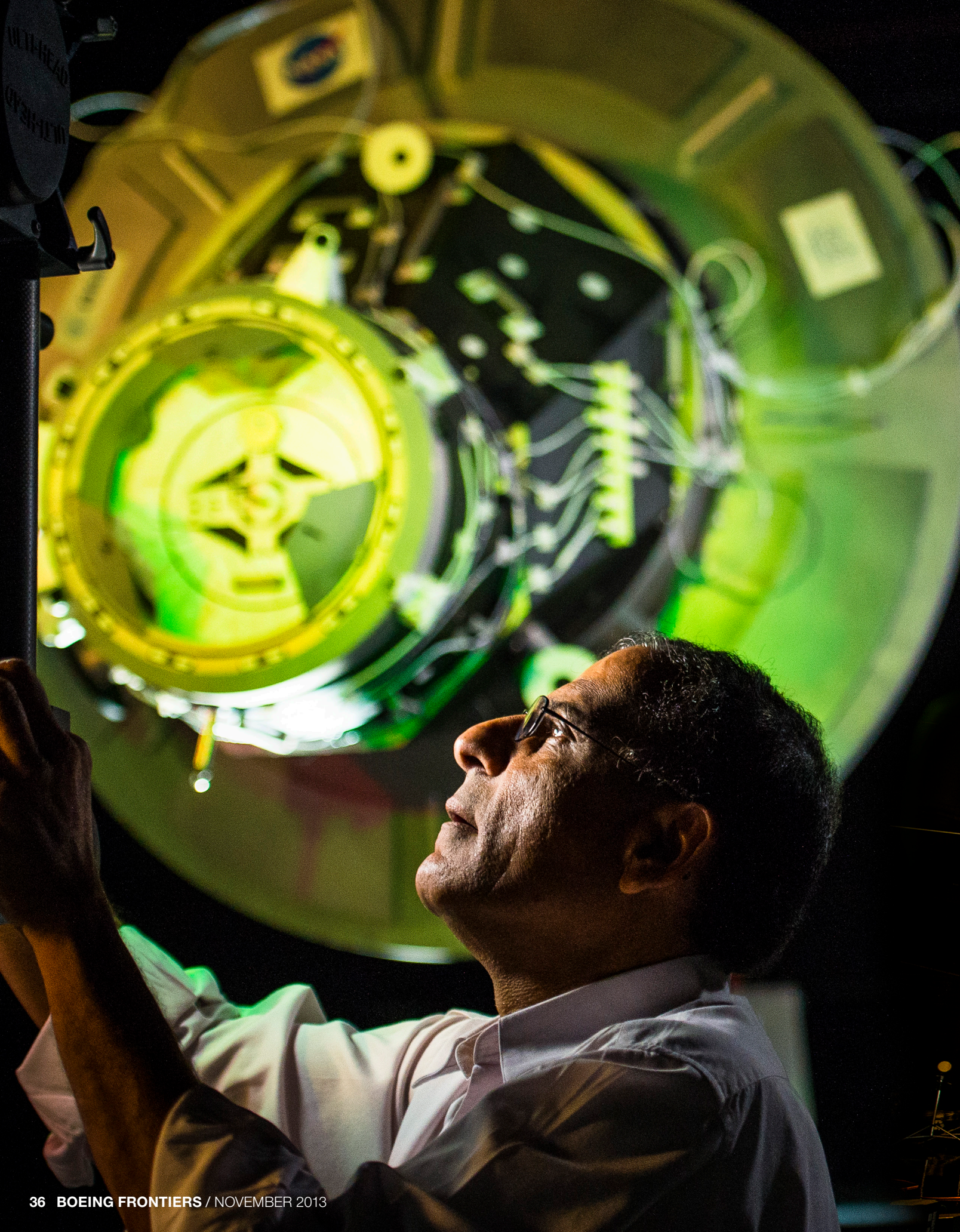
Staying close to its space exploration roots, Huntington Beach is playing a major role in NASA's powerful new launch vehicle—the Space Launch System, or SLS. It is designed to send astronauts into deep space, perhaps to Mars. Boeing is responsible for the rocket's core stage and avionics.

Propulsion engineer Jason Grow is part of a team at Huntington Beach that supports

> "It's a place where engineering students are eager to get their foot in the door ... to learn from seasoned engineers across a wide spectrum of disciplines."
>
> – Alex Lopez, Huntington Beach site executive and vice president of Advanced Network & Space Systems

PHOTOS: (From left) Kevin Meredith, Enterprise Innovation Cell Lead, and Phantom Works Ventures technology manager, leads an idea generation session in the Huntington Beach Innovation Cell; industrial engineers Aaron Lombard, left, and Richard Garcia check designs that will be developed using 3D rapid prototyping capabilities; systems engineers Christian Dommell, left, and Tracey Espero evaluate payload integration options on a Phantom Phoenix small satellite prototype model.





> "It's exciting to be on the cutting edge of development of this advanced spacecraft."
>
> – Tom Andrews, team lead, CST-100 Structures, Mechanisms and Ordnance Systems

PHOTOS: (Left) Raj Shori, Optics engineer, checks the sensor system on the autonomous docking system for the Boeing CST-100 space capsule in front of a one-quarter scale replica of the International Space Station Pressurized Mating Adapter. (Below) Software engineers Keith Cok, from left, Adrian Uyehara, Van Duong and Mike Beaven test the Vision-based Electro-Optical Sensor Tracking Assembly, or VESTA, software system that will use electro-optical sensors to autonomously guide the CST-100 to dock with the space station.

the design, architecture, analysis and testing of the rocket's main propulsion systems.

"We have so much spaceflight history to be proud of," he said. "The SLS vehicle will be a cornerstone to manned missions planned for the next 20 to 30 years. How many people can say they have a job that will help boost a new age in space travel?"

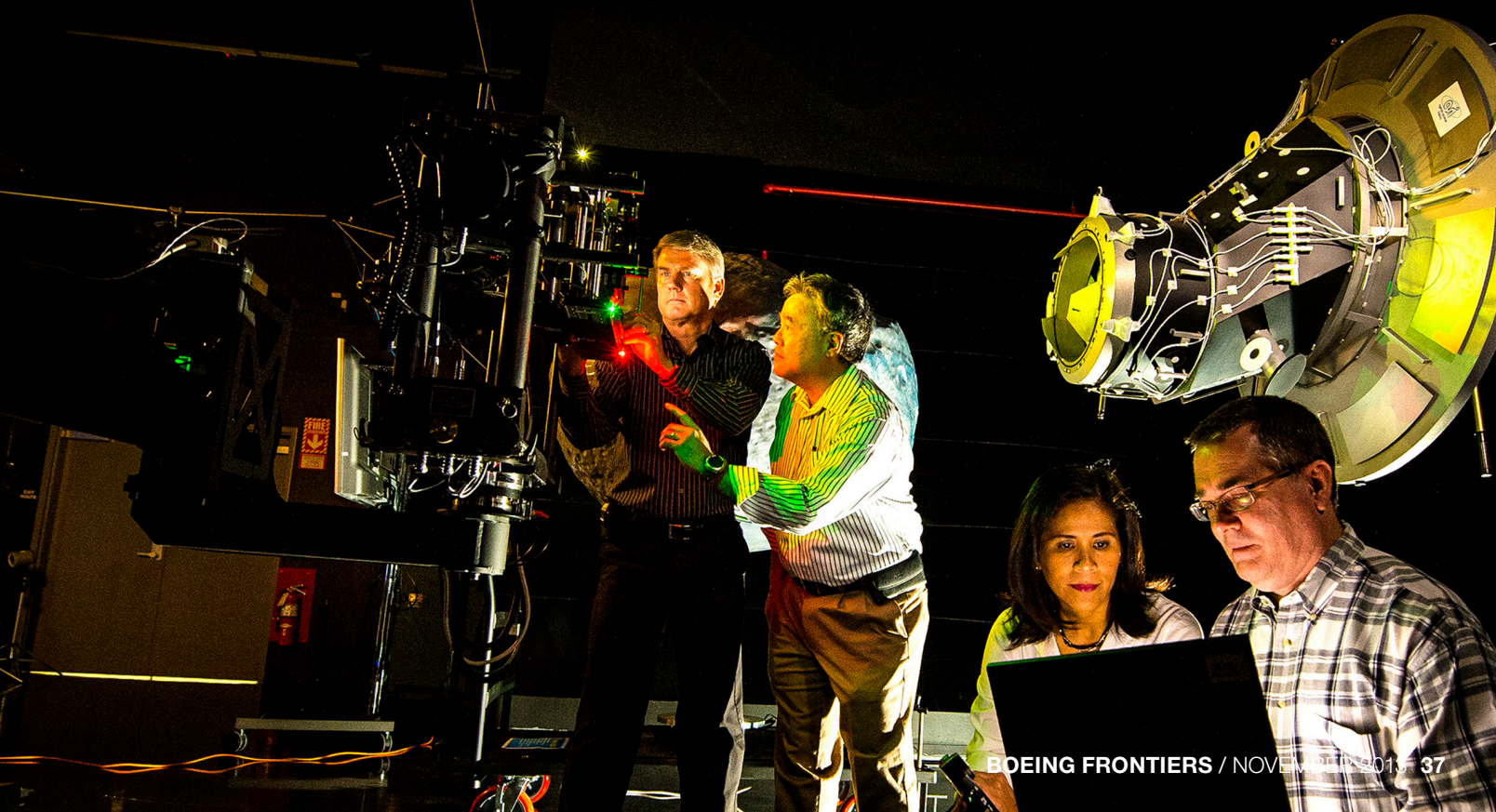
Huntington Beach is also involved in development of the CST-100 (Crew Space Transportation), Boeing's entry in a NASA competition for a spacecraft that will transport crew and cargo to the International Space Station and other low-Earth orbit destinations. Several Huntington Beach teams support the design, development and testing of CST-100.

"It's exciting to be on the cutting edge of development of this advanced spacecraft," said Tom Andrews, team lead for CST-100 Structures, Mechanisms and Ordnance Systems. Andrews said the program leverages the experience of professionals from prior Huntington Beach programs such as the space shuttle, Delta launch vehicles, space station and even aircraft design.

While some Boeing teams at Huntington Beach are looking toward space, others are focused on Earth-bound programs:

- The Information Security Innovation Lab prototypes cybersecurity technologies, using live networks in a secure yet real-world environment.
- A million-gallon (3.8-million-liter) indoor water tank—the same one used decades ago to test spacecraft and equipment for those early journeys into space—is now used to test and upgrade systems for Boeing's Echo Ranger, a remotely operated unmanned underwater vehicle, and other projects.
- A Phantom Works team at the site was responsible for program management and design of Boeing's X-51A WaveRider, which earlier this year flew at five times the speed of sound—that's about a mile per second (1.6 kilometers per second)—for 210 seconds on scramjet power. It was the longest air-breathing, scramjet hypersonic flight in history—and represented a big step in hypersonic research.
- Employees designed and tested the liquid hydrogen fuel system on Boeing's Phantom Eye, a high-altitude, long-endurance unmanned aerial vehicle powered by liquid hydrogen.
- A team is working on a system of wideband satellite communications terminals (FAB-T) that will provide the U.S. military with critical protected communications.

Brown, the engineer who loves those early morning opportunities to surf, has worked on a number of programs during his years with Boeing. He now manages



a team of 25 engineers who execute advanced air vehicle study contracts from the likes of NASA, Air Force Research Laboratory, and the Defense Advanced Research Projects Agency, or DARPA.

In a sophisticated engineering environment like that at Boeing, Brown said, it's been important to him to connect on a human level with those he works with. One way he's done that—for as long as he's worked at the Huntington Beach site—has been taking interns, co-workers and even a few customers out on the waves.

"It's a great way—outside the formality of the office—to get to know someone, to really build trust," Brown said.

On several Saturday mornings this summer, Brown took Nick Pera to the beach and taught him surfing fundamentals. Brown was supervising Pera's 11-week internship at the site, where Pera was assigned research on aircraft emissions from auxiliary power units.

"Surfing with Eric definitely helped foster a good positive relationship," Pera said. "Out on the water, you talk about things in a different way than when you're both in the office trying to get work done."

For Brown, water and surfing will always be an important part of his life. But just as meaningful are the opportunities he's had as an engineer to work at the Huntington Beach campus.

"It would be so easy for this site to rest on its laurels given its impressive history," Brown said. "But there's always something new percolating. The focus on innovation provides a haven for engineers like me who love a challenge. Huntington Beach—the city, the beach and Boeing—have definitely provided good opportunities for me."

Kevin Castleberry, Market Engagement manager, agreed. Having worked in customer relations, domestic trade shows and special events at the Huntington Beach site for 14 years, he's seen the facility change with the times and stay in front of customers' needs.

"I've seen quite a transition from the manufacture of Delta rockets years ago to the work now being done on futuristic space vehicles, as well as advances in areas like intelligence, cybersecurity and unmanned systems," Castleberry said. "In a city known for its laid-back surf culture, I feel a real sense of pride supporting the sophisticated level of work being done here." ■

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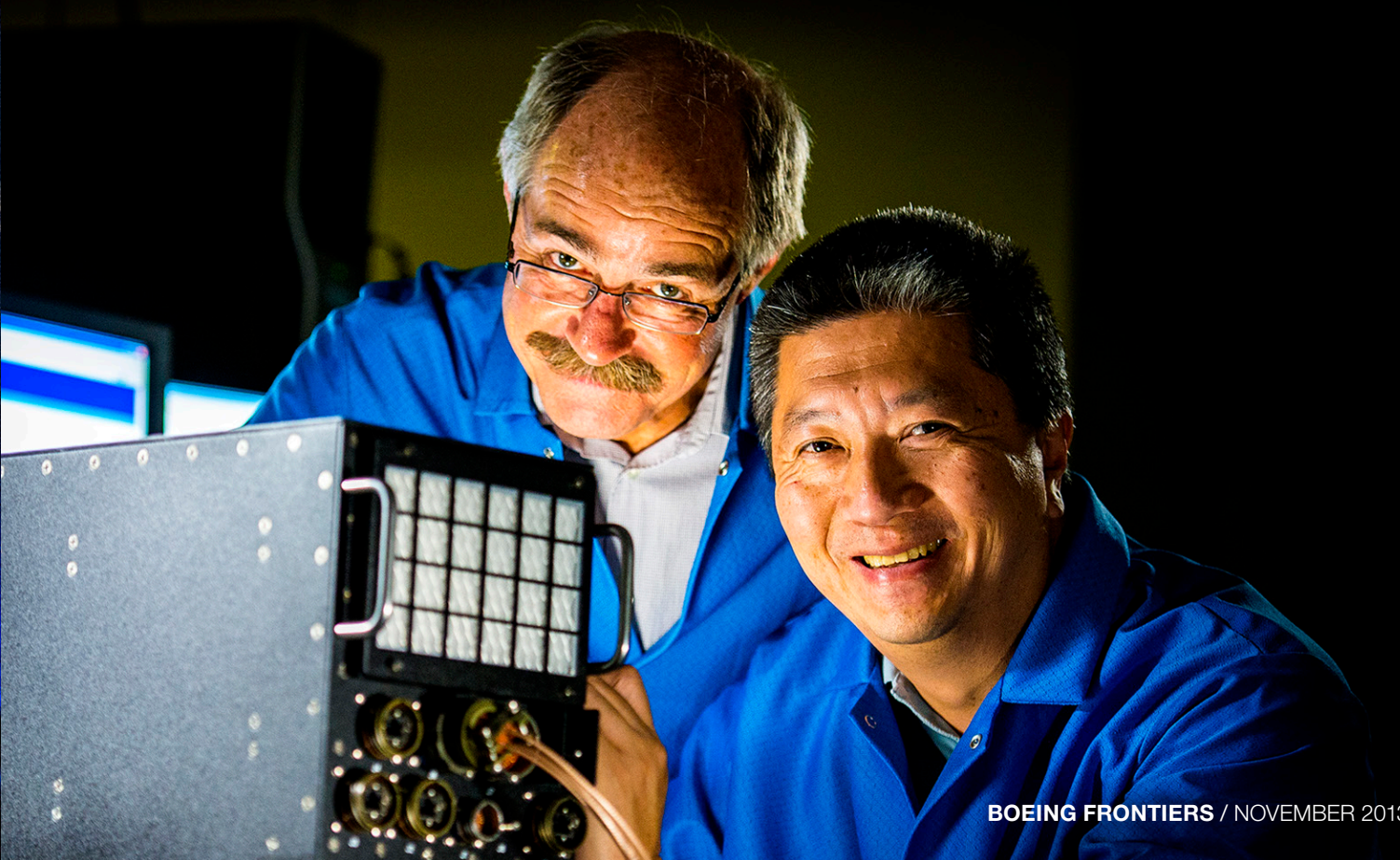
"The focus on innovation provides a haven for engineers like me who love a challenge."

– Eric Brown, senior manager of Advanced Concepts, Boeing Research & Technology

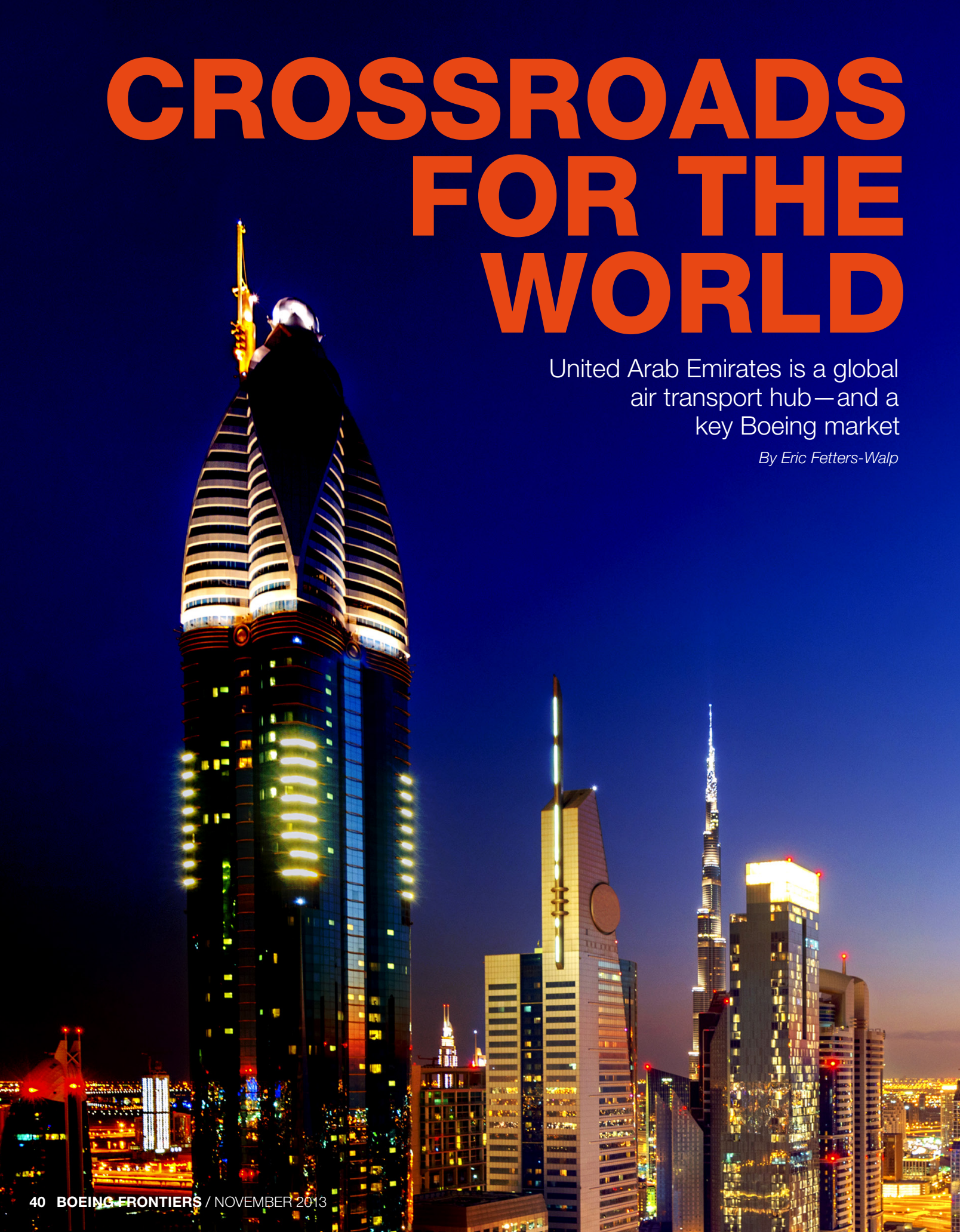
PHOTOS: (Far left) Kristie Kassem, left, industrial engineer, and Steve Gall, electrical engineer, review a 3D prototype for the Tactical Compact Communications Relay, a small communications device that is installed on unmanned aerial vehicles to provide extended data and voice relay capability. (Below) Engineers Dave Carter, left, and Keith Woo prepare a developmental wideband satellite communications modem for planned demonstrations of airborne connectivity.



CROSSROADS FOR THE WORLD

United Arab Emirates is a global air transport hub—and a key Boeing market

By Eric Fetters-Walp



The 2013 Dubai Airshow in the United Arab Emirates (UAE) runs Nov. 17–21 at its new home, Dubai World Central, the city's second and newest airport. The biennial air show, first held in 1989, has become one of the world's largest, with orders totaling $63 billion during the 2011 show. That year, 960 companies from 50 countries, including Boeing, were represented at the five-day event. Boeing, which has a long and strong relationship with the UAE, also will be a major presence at this year's air show.

The site of modern Dubai once was a caravan station along the Arabian Peninsula's trade routes. Further west along the coast, Abu Dhabi was a village of fishermen and pearl divers that saw its first settlers more than five millenniums ago.

The two emirates' past as gathering spots for desert travelers echoes today, as Dubai and Abu Dhabi, the largest cities in the United Arab Emirates (UAE), have emerged as international business centers at the strategic crossroads between Europe and Asia. The UAE's federation of seven emirates, which became an independent nation just more than 40 years ago, is collectively one of the world's top 10 producers of crude oil but is intent on diversifying economically.

That strategy includes becoming a global hub for air transport, as evidenced by growth among the nation's ambitious airlines and its rapidly expanding airports.

The UAE is a major market for Boeing's commercial and military products. One of the country's main airlines, Emirates, is the world's largest operator of Boeing's best-selling 777 twin-aisle jetliner.

"You look at what the UAE has done in a short amount of time and it's pretty tremendous," said Jeffrey "J.J." Johnson, president of Boeing Middle East, from his office in Dubai. "In Dubai especially, you've seen the emirate attract hub traffic that used to go elsewhere, and now it also has more people stopping over for a visit instead of just passing through."

Passenger traffic at Dubai International Airport reached nearly 57.7 million in 2012, up 13 percent from the previous year. Already ranked as the world's second-busiest airport in terms of passenger numbers, the airport is expected to serve more than 65 million passengers this year. Dubai's second major airport is preparing to host regular commercial flights as well.

Meanwhile, Abu Dhabi International Airport has raised its annual capacity to 12.5 million passengers and, after an ongoing expansion, hopes to reach 40 million passengers by 2017, according to the government-owned enterprise that oversees the airport. The Airports Council International named Abu Dhabi International Airport as the region's best airport last year.

Many of those passengers and visitors are arriving on airplanes operated by the UAE's three major commercial airlines.

"The UAE is the world's third-largest market for Boeing," said Marty Bentrott, Commercial Airplanes vice president of Sales for the Middle East, Russia and Central Asia. "The strategic foresight of the country's leaders that has led to the rapid growth of the airlines and the expansion of its infrastructure has made it an increasingly popular hub for both passenger and cargo flights. It is justifiably a matter of pride for us that a sizable part of the UAE airlines' fleet comprises Boeing airplanes such as the 777."

Emirates Airline has emerged as the Middle East's largest airline and the fourth-largest in the world. Launched by the Dubai government in 1985, the airline operates more than 3,000 flights every week between more than 70 countries.

Etihad Airways, started in 2003 by the Abu Dhabi government, is also expanding rapidly. In 2012, its 10.3 million passengers represented a 23 percent increase from the previous year. The airline's mixed fleet includes 16 777-300ER (Extended Range) jetliners, and Etihad also has orders for 41 787-9 Dreamliners.

Low-cost carrier flydubai, which began flying just four years ago, runs an all-Boeing fleet of Next-Generation 737-800s to shuttle travelers between destinations in Asia, Europe and Africa. And flydubai was the first airline in the world to take delivery of

UAE AT A GLANCE

ABU DHABI
CAPITAL CITY

2ND WEALTHIEST
ECONOMY OF THE MIDDLE EAST

7.1 MILLION
POPULATION

32,278 SQUARE MILES
(83,600 SQUARE KILOMETERS)
COUNTRY AREA

PHOTO: Dubai is the most populous city in the United Arab Emirates and home to the biennial Dubai Airshow. GETTY IMAGES

the Boeing Sky Interior in 2011.

Through their years of expansion, the UAE's airlines have developed enviable reputations for service, with Emirates Airline winning the "World's Best Airline" from the Skytrax World Airline Awards earlier this year. Emirates and Etihad also won several other awards this year.

"Even as our products and services enable their success, the way in which the UAE's airlines operate Boeing airplanes reflects positively on our products," said Shep Hill, president of Boeing International and senior vice president of Business Development and Strategy.

The UAE is at the center of a Middle East market that will require more than 2,300 new airplanes—worth an estimated $470 billion at list prices—between now and 2032, according to Boeing's 20-year *Current Market Outlook*. With that in mind, Boeing is working closely with financiers in the UAE, entering into the region's first working-together agreement for aircraft financing and leasing cooperation with the National Bank of Abu Dhabi.

Boeing Defense, Space & Security also has established strong ties with the UAE and has identified the UAE as one of seven key nations outside the United States for developing future business. The UAE's military forces possess Apache and Chinook helicopters and a half-dozen C-17 Globemaster III heavy-lift aircraft. The nation's Thuraya Satellite Telecommunications operates three types of Boeing satellites.

Additionally, Defense, Space & Security, along with Abu Dhabi–based Advanced Military Maintenance Repair and Overhaul Centre (AMMROC), teamed in 2011 to ensure the operational readiness of UAE Armed Forces aircraft. Boeing has partnered with Abu Dhabi Autonomous Systems Investments, which is allowed to provide training, support and marketing services for unmanned aircraft systems in the region. A third partnership agreement, this one between Boeing and UAE's SecureTech, aims to provide cybersecurity services to government and business customers.

"Boeing places a significant amount of focus on establishing partnerships in the Middle East, and in the UAE we are extremely proud of our collaborative record there," said Paul Oliver, BDS International Business Development vice president for the Middle East and Africa. "Boeing is not about going in and simply selling a product. We are about working together, about being a part of the local community, about achieving mutual success."

Such collaborations also are evident in a number of manufacturing and research and development activities, part of what Hill calls a "growing, budding industrial partnership" between Boeing and UAE entities.

For example, the Masdar Institute of Science and Technology, Etihad and Honeywell UOP have teamed with Boeing to establish the Sustainable Bioenergy Research Center in the UAE. The project hopes to use saltwater agricultural systems to support the development and commercialization of biofuel crops for aviation and other uses.

In the aerospace manufacturing realm, Boeing and Mubadala Development Co., a business development and investment vehicle of the Abu Dhabi government, have established a relationship that will support Boeing production and advance the UAE's commercial aviation industry. In 2012, the companies announced a 10-year contract for Strata Manufacturing, Mubadala's advanced composite aerostructures facility in Al Ain, to produce empennage ribs for the 777 and vertical fin ribs for the 787 Dreamliner. The agreement also positions Strata to be a future supplier of the Dreamliner's vertical fin.

Strata is working toward the first delivery of UAE-manufactured ribs that will be incorporated into the tail of a 777. Boeing has provided tooling and is supporting Strata, as Boeing does with many suppliers, through a long-term engagement plan that encompasses training and advanced manufacturing techniques to continuously expand the company's capabilities.

"Mubadala views Boeing as a unique partner to reach their goal of developing an indigenous aviation manufacturing industry," Hill said. "Expanding aviation manufacturing builds new skills for Emiratis, expands their economy and lessens the UAE's significant reliance on the oil industry."

Growing its own aerospace industry will require a new generation trained in that and other fields.

Boeing has been a partner of the UAE Higher Colleges of Technology for nearly a decade, and the two are focused on

developing leadership skills. High-potential alumni of the Higher Colleges of Technology attend programs at the Boeing Leadership Center near St. Louis while selected students of the institution participate in a Boeing-developed, UAE-based mentorship program. Boeing also has selected UAE students for its International Business Intern Co-Op program, which allows students to spend six months working at the Commercial Airplanes plant in Renton, Wash.

Boeing also works with engineering programs at Abu Dhabi Men's College, Khalifa University and UAE University to support the development of curricula and provide opportunities for hands-on experiences.

"Boeing's presence in the UAE is growing on multiple levels," said Dana Salloum, the Dubai-based director of Government and Community Engagement for Boeing Middle East. "The local team is fortunate to participate in this growth and be able to organically contribute to Boeing's success through programs that build connections with the local community and government agencies."

Johnson, Boeing's Middle East president, has been based in Dubai since early 2011. Boeing's growing presence in this dynamic country with a fast-growing economy positions it well for the future, he said, adding: "It is a great place to live and be in the community. There's a diversity of culture, opportunity and fun things to do. A lot of people love it here and stay longer than they ever expected." ■

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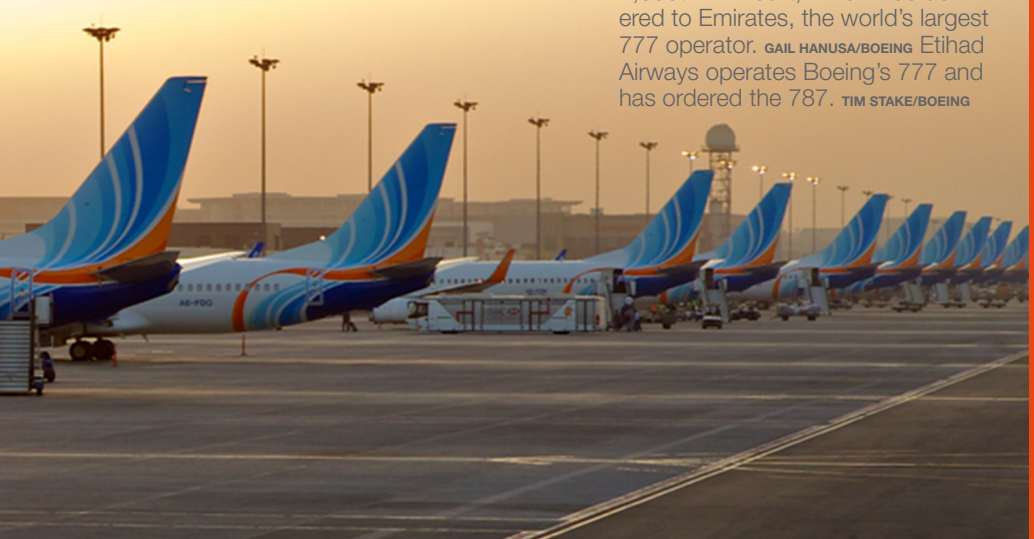
PHOTOS: (Below) Low-cost carrier flydubai operates a growing fleet of Next-Generation 737s, seen here at the Dubai International Airport. FLYDUBAI (Insets, from top) A Boeing CH-47F Chinook helicopter for the United Arab Emirates. FRED TROILO/BOEING In March 2012, Boeing employees in Everett, Wash., celebrated the 1,000th 777 built, which was delivered to Emirates, the world's largest 777 operator. GAIL HANUSA/BOEING Etihad Airways operates Boeing's 777 and has ordered the 787. TIM STAKE/BOEING



BOEING AND THE UAE

A partnership that's more than just aerospace

Boeing's corporate citizenship efforts in the United Arab Emirates focus primarily on the development of the nation's workforce and nurturing entrepreneurs.

Boeing has worked with organizations such as INJAZ, INDEMAJ, Arab Youth Venture Foundation and others to support the development of Emirati teachers and improve job skills of Emirati youth. INJAZ-UAE is a member of Junior Achievement Worldwide, which is dedicated to educating students about workforce readiness, entrepreneurship and financial literacy. Since 2005, INJAZ-UAE has reached more than 15,000 students at 43 schools and universities. The organization also matches corporate volunteers to mentor young people up to the age of 24 and runs job shadowing programs.

In collaboration with The Khalifa Fund, Boeing has supported the Business Development Center, which aims to help unemployed, unskilled youth in the UAE by teaching them practical skills and sponsoring mentorships.

Through the Arab Youth Foundation, Boeing has helped an Emirati student participate in a NASA internship and trained teachers on how to make math and science education fun for students. The company also has supported Action Care's "Early Start" program, which trains parents, teachers and caregivers in maximizing children's learning potential before formal education begins.

Other UAE organizations receiving Boeing support include INDEMAJ, which has set up three resource and development centers for schools in rural parts of the UAE and trained the teachers on interactive and multisensory teaching methods.

– Eric Fetters-Walp

HIRE CALLING

Newly hired veterans share stories of military service

By Vineta Plume

While on a yearlong deployment to Afghanistan, U.S. Army reservist Chad Heidtman saw firsthand the capabilities of Boeing products such as the AH-64 Apache and CH-47 Chinook helicopters, the F-15E jet fighter, and the C-17 Globemaster III airlifter. Now a contracts administrator for the F-15 program in St. Louis, he credits these "four masterpieces" for his safe return home—and for inspiring him to pursue a career with the company that builds them.

Heidtman is one of many veterans recently hired by Boeing, which has since 2011 added nearly 3,800 self-identified veterans to its ranks.

Throughout the United States, Boeing actively recruits at military-targeted job fairs and on-base transition assistance sessions. It also supports the White House–led initiative "Joining Forces," which helps connect veterans and military families with resources to find jobs. To further attract veterans to its workforce, Boeing in 2011 launched the Boeing.com transitioning military careers website and a skills translator tool to help current and former service members transform their service work experience and training into career opportunities with Boeing.

"We're working very hard not only to recruit veterans but also to make it easier for them to match their skills and experiences to our needs," said Tony Parasida, senior vice president of Human Resources and Administration. In addition to leadership capabilities and experience working with teams, veterans bring diverse perspectives that complement Boeing's culture of collaboration and innovation, he said.

Nichole Parr, who served five years in the U.S. Navy before joining Boeing Capital Corp. as an Aircraft Technical Service project manager in 2011, said she often draws on her military experience to guide her on the job. "Many times there are high-stress situations, when delivery of an aircraft seems impossible, that I remember my military training and am better able to deal with finding other solutions."

Jay Sheer, hired in 2011 as an Apache Systems training instructor with Learning, Training and Development in Mesa, Ariz., after 20 years' experience working with Apache aircraft in the Army, considers landing a job at Boeing a matter of pride. "I have seen what the selfless service of those who work here has provided the warfighter and can say I'm proud to be part of the Boeing team."

Today, more than 23,000 self-identified veterans help make up Boeing's team—and many continue to serve in the U.S. National Guard and Reserves. On the following pages, meet some recent hires who describe in their own words what their service has meant to them as they transition into new careers with Boeing. ■

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For more stories of service, visit www.boeing.com/tribute.

THE RIGHT CHOICE

ENRIQUE VIDAL JR.
Information systems security engineer
Mission Operations Colorado
Boeing Defense, Space & Security
Aurora, Colo.

Retiring from the U.S. Navy following 21 years of service, I found my first venture into the civilian job market left me feeling both apprehensive and eager to start a new adventure.

I came to Boeing in July by way of networking. Although I had seen an advertisement through a military recruiting seminar and career fair, there were no openings in my location preference at that time, so I had to be patient. My colleague knew a Boeing employee who knew of a job here that fit my skills. I had been watching Boeing job announcements, using the Boeing Careers site, and already had an account. So once I knew a job was available, I applied—and here I am.

I joined the Boeing team in July and feel I made the right choice. My military experience not only provided valuable technical skills but also instilled commitment to team and professionalism—which I have found, in my short time here, are valued by my management team and Boeing. My teammates have been eager to help and are always willing to answer questions. My management team has gone out of its way to make my transition into Boeing run smoothly. It definitely helps that our team is filled with other veterans who understand the transition that I have made.

The future is bright, and I look forward to my future with Boeing. ■

PHOTO: PAUL PINNER/BOEING

PART OF A STRONG TEAM

BENGIE SECUSKIE
Aviation Life Support technician
Boeing Test & Evaluation Flight Operations
Engineering, Operations & Technology
Tukwila, Wash.

In 2009, I was in the U.S. Army and stationed in Fort Lewis, Wash. Preparing for separation from the military and for life as a civilian, my goal was to join the Boeing team. The company has a large presence in the area and Boeing would have been a great next step.

Having worked primarily on helicopters in the Army, I lacked the experience for contracting jobs supporting the Navy, Air Force and Marines. Alternatively, I was picked up on the Presidential VH-71 Program. Six months after I started, however, the program was terminated and everyone was laid off. That was my first eye-opener for life as a civilian.

I was unemployed when a position in Life Support came available in Boeing. I applied through the Boeing website, and shortly after that, the hiring manager called to speak to me about my resume. He liked my attitude and resume, but I still lacked the experience to qualify.

For the next two years, as I worked for military contractors around the country, multiple job openings at Boeing came available. I just wasn't interview material.

But that Boeing hiring manager stuck with me, and guided me in the things I needed to know to become experienced enough to be a part of his team. Eventually he hired me as a contractor through a company supporting the Navy pilot training program—my first job in fixed-wing aircraft. This is where I got my experience with parachutes, life rafts, flight helmets, oxygen masks. As a contract hire for Boeing, I realized even more that being with Boeing was what I wanted. Learning more and proving myself a valuable team member, I was hired this year as a full-time Boeing employee. Now I inspect pilots' flight gear for programs, including the P-8 and Airborne Warning and Control System aircraft.

I often think about how someone I never met stayed with me to get me where I am now. I will always be grateful for the time he took—time he didn't have to take—to bring me aboard such a great company. ■

PHOTO: BOB FERGUSON/BOEING

MILITARY SERVICE IS A GOOD TEACHER

JACKIE SULLIVAN
Facilities planner
Site Services
Shared Services Group
North Charleston, S.C.

I graduated from the Air Force Academy in 2008 with a Bachelor of Science degree in civil engineering and then spent five years as a civil engineer officer in the U.S. Air Force. During this time I deployed twice in support of Operation Enduring Freedom. My first time was to Afghanistan during the summer of 2010, where I was a project manager and design engineer for construction projects at Kandahar Airfield and in Kandahar City. When I came back from this deployment, I was thankful for little luxuries such as air conditioning and hot showers, which in Afghanistan are not always a guarantee. My second deployment was to Saudi Arabia in 2012, where I led the engineering section responsible for facility planning, design and construction.

I separated from active duty in May to spend more time with family. While I was on a house-hunting trip in Charleston, S.C., a lot of the new housing developments were offering discounts for military and Boeing personnel. Everyone had good things to say about Boeing, so I decided to apply online. I used Boeing's online skills translator tool to help me with the wording on my resume, mostly to identify how my military experiences relate to the civilian world.

I was hired in June as a facilities planner. I am also now a reservist at Charleston Air Force Base. My military service has been instrumental in gaining the training and experience necessary for my Boeing career. I spend a lot of time developing facility plans and building cost estimates to meet specific customer and organizational requirements. There are many similarities—machinery, processes, being able to understand the customer's perspective—between facilities that support military airfield operations and those that are required to support production of the 787. ■

PHOTO: ALAN MARTS/BOEING

A LIFE-CHANGING EXPERIENCE

JOSEPH WHIPPLE
Assembler, 787 program
Safety lead
Commercial Airplanes
North Charleston, S.C.

While serving as a gunner in the U.S. Army, providing convoy security in Iraq, my vehicle rolled over several times while avoiding a possible improvised explosive device. I was ejected and received life-threatening injuries. After a lengthy stay at an amputee ward, I was able to leave with both of my arms—they just didn't work very well.

I spent the next 20 months receiving extensive occupational and physical therapies to try and regain as much function as possible in my arms. Ultimately, all of the injuries I sustained (17 broken bones, and 15 surgeries to salvage my arms) were enough to force an early retirement from the Army. I spent the next two years readjusting to civilian life and working in my community with a nonprofit veterans organization. I also worked with the Wounded Warrior Project, trying to spread awareness and gain support.

I applied for a position with Boeing in March of 2011. A year and a half later, I was hired as a contractor and started my training program for the 787 program. During my first couple of months here, the position of safety lead became available. I had shared with some of my co-workers my life-changing experience in Iraq, and thought that I could possibly make a difference as my team's safety lead. I am a certified first responder and a former emergency medical technician, so I thought that between my education and life experiences, I would do well in the position.

I became safety lead this past February. I take my role seriously and set the bar high. In April, I became a direct hire, and since then have been promoted to assembler. ■

PHOTO: ALAN MARTS/BOEING

PASSION FOR AVIATION

DAMIN KIRK
Work statement manager
Commercial Aviation Services
Flight Services
Commercial Airplanes
Renton, Wash.

I joined Boeing in September 2012 after a six-year stint in the U.S. Air Force. My journey started with a strong passion for aviation, in particular airplanes. I'm the son of a retired B-52 pilot and have had a fascination with airplanes since I was a kid. Responding to a strong call of duty, I joined the Air Force.

There, while working airfield operations around products such as the C-17, the F-15 and the 747, I saw the power of Boeing up close, and that was when my intrigue with the company started. I did a lot of research on Boeing. I was attracted to the culture at Boeing, the integrity, the respect, the trust and the strong commitment to excellence. When I made the decision to transition out of the Air Force, I wanted to be with a company that truly lived the values it wrote on paper.

What helped me tremendously in my transition was that I got my master's degree in aeronautical science. I attended a career expo on campus and was able to connect with a few people who worked at Boeing, including recruitment.

My military career taught me structure, patience and what commitment truly means. As a work statement manager in Commercial Aviation Services, I use these values—the need to be patient and gather all the resources needed for a project to be successful—every day and see others doing the same.

I didn't "end up" at Boeing. This was a destination for me, and I'm truly honored and humbled to have been given the opportunity to be part of the great Boeing team. ■

PHOTO: BOB FERGUSON/BOEING

CAREER

When it comes to career development, experience is a good teacher—but not the only one

By Geoff Potter and photos by Bob Ferguson

When Courtney Carr joined the Boeing P-8A Poseidon program three years ago in Tukwila, Wash., the Mercer University graduate was assigned a mentor—none other than the head of the P-8 program.

But it wasn't just she who benefited from the experience, according to Carr, then a young liaison engineer. Her new coach, Chuck Dabundo, learned quite a bit as well.

"While Chuck helped me learn about the program and the process we follow to build P-8 aircraft, I helped him learn about communicating with the new generation entering the workforce," Carr said.

She urged him to consider spreading the word about important developments and soliciting ideas via tools today's employees use constantly—such as text messaging and Boeing's internal social-media tool, InSite.

"He was open to learning from someone new to the team, someone younger than himself," she said of the Boeing vice president and former P-8 program manager who was her early mentor. "His example taught me to be open to everyone's ideas."

She is now mentoring other engineers who are new to the company.

Like Boeing employees around the world, Carr is always looking for ways to further her career and said that mentors and coaches have helped her enhance her skills and gain crucial experience.

MOVES

At the start of each year, employees are asked to define their career goals and detail their development plans. One tool that can help them plan is known as the "70/20/10" model. It was adapted from research conducted by the Center for Creative Leadership on how much time people spend on various types of development.

The research found that roughly 70 percent of an individual's development stems from learning from new experiences—such as leading team projects or special assignments. Another 20 percent comes from what is learned from others: formal mentoring, for example, as well as being a mentor, job shadowing, and receiving feedback about job performance. According to the research, only about 10 percent of a person's development comes through formal education, training and self-study.

"When people are looking to advance in their careers they often think only of formal education, but we actually have a wealth of ways to grow," said Heidi Capozzi, vice president of Leadership Talent Management Organization Effectiveness. "We learn a lot from training courses and self-study, but people spend significant time—and often gain significant valuable experience in—tackling business problems, helping teams streamline processes, diving into special assignments, even leading volunteer projects."

Consider the career paths taken by Boeing employees Greg Kawiecki and Marques Johnson.

Kawiecki has gained valuable knowledge from myriad new experiences. A systems engineer with Engineering, Operations & Technology, he came to Boeing midcareer, after earning a PhD, teaching engineering at the University of Tennessee, and working for the better part of a decade as a research and

PHOTO: Liaison engineer Courtney Carr, center, mentors new Boeing Defense, Space & Security engineers Katherine Braun, left, and Marsha Mallizzio on the P-8 program.

70% **LEARNING FROM NEW EXPERIENCES**

Leading a team or first-time project; influencing without authority; special assignments

20% **LEARNING FROM OTHERS**

Formal mentoring, including reverse-mentoring and peer-to-peer; job shadowing; receiving feedback and coaching on work performance

10% **LEARNING FROM COURSES, MATERIALS**

Pursuing higher education; leadership development courses; research and self-study

Boeing employees can use the 70/20/10 development model as a guide for their careers.

development engineer and group lead for aviation engineering firms in Madrid.

In his six years at Boeing, Kawiecki has helped start up and staff two research projects in his native Poland, participated in a global emerging-leaders program, contributed to Boeing teams and become an Associate Technical Fellow. He now serves as research and technology director for Central & Eastern Europe.

He said he also gained valuable insight in learning how to "influence without authority" by aiding a Boeing Research & Technology–Europe team looking to develop environmentally responsible unmanned aerial vehicle technologies.

"I didn't have any authority whatsoever, but I did have some ideas," he said.

The proposal preparation team adopted many of his ideas—and won funding for their proposal.

Like Kawiecki and Carr, Johnson joined Boeing after gaining experience in other industries. Johnson worked in the financial services and nonprofit sectors before Boeing hired him as a project manager in 2008.

"I learned that I like helping people deal with complex problems," Johnson said. "They were great jobs but not what I had in mind for my career in terms of breadth, depth and variety of experience."

Now a program finance manager with Commercial Airplanes, he has pursued several educational opportunities through Boeing's Learning Together Program, which provides tuition assistance for many employees. He has earned two project manager certifications including one from Stanford and in 2012 finished his master's degree in business administration.

"Without that MBA, I wouldn't have been a leading candidate for this finance manager position," he said of his current job.

Johnson offered his own guidance for others seeking to reach their career goals.

"Start with the end in mind, understand what others expect from you and, at the same time, find out what you're passionate about," he said. "If you want just to get in line for the next promotion, it won't work. Find your passion, throw yourself into it, look for balance along the way—and work your tail off." ■

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PHOTO: Mentors and coaches helped liaison engineer Courtney Carr enhance her skills, gain experience and advance her career.

DREAM FLEET

First 787 ushers in ambitious fleet revitalization for Mexico's global airline

By Jim Proulx

Aeromexico has long been at the forefront of aviation in Mexico. As the flag carrier for that Latin American nation, Aeromexico founded and grew commercial aviation in the country beginning in 1934, and it has established a long and vital history for the region.

And it is now leading the way into the next era for a new generation of passengers in Mexico and around the world. The airline has embarked on a fleet revitalization strategy that will give Aeromexico one of the most modern, advanced fleets in the industry over the next several years—including the 787 Dreamliner.

"Aeromexico has led the way in aviation in Latin America, and is stepping forward to lead the world," said Van Rex Gallard, vice president, Sales, Latin America, Africa and the Caribbean, for Boeing Commercial Airplanes.

At a ceremony in August at Paine Field in Everett, Wash., Aeromexico took delivery of its first 787, bringing more than 100 of its company leaders, shareholders and key customers along, then flying them home in the brand-new airplane. And when the 787 arrived in Mexico City, it was greeted by a day-long celebration, including a media show, employee tours and a gala that featured a laser-light display.

"This is a win-win situation for everybody," Aeromexico Chief Executive Andres Conesa said about the introduction of the 787 into the airline's fleet. "For the consumers, we will have simply the best product you can offer—the best in the world, there is nothing better. For the crews we will have the best working environment. And for the shareholders, we will have the best economics, and that's key for them."

The delivery was the culmination of a series of landmarks in Aeromexico's effort to build one of the most advanced fleets in the sky, a fleet that carries more than 14 million passengers every year around Mexico and the world. After committing to the Dreamliner in 2006, Aeromexico is now aiming to build a fleet of 19 787s, with plans to use the airplane on routes connecting Mexico City with destinations around the world, according to Conesa. The airline's plans for the 787 include such destinations as New York, Paris and Tokyo.

Aeromexico also has called on Boeing to help renew its single-aisle fleet. The carrier committed in the summer of 2012 to 90 737 MAX airplanes, along with 10 787-9s. That major order was yet another renewal of a 50-year relationship with Boeing, which dates back to the airline's first DC-8 order in 1960 with heritage company Douglas Aircraft.

Since then, Aeromexico's Eagle Knight emblem has graced a range of Boeing-family products, including the DC-8, DC-9, DC-10, 737, 757, 767, 777 and now the 787.

"It's a relationship that has been a cornerstone for both companies," Boeing's Gallard noted. "We're looking forward to working with this great carrier for decades to come." ■

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PHOTO: A Boeing 787 Dreamliner in Aeromexico livery.
ED TURNER/BOEING

IN THE LINE OF DUTY

Boeing C-17 Globemaster III airlifters, Boeing KC-10 tankers and Lockheed C-5B Galaxies from the 60th Air Mobility Wing at Travis Air Force Base, Calif., prepare to take off in succession from the base on Sept. 11, 2013. The 22-aircraft "freedom launch" took place on the 12th anniversary of the Sept. 11 terror attacks on the U.S., with the first C-17 taking off at 8:46 a.m., the same time the first plane hit the North Tower of the World Trade Center in New York City 12 years earlier. PHOTO: U.S. AIR FORCE


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The P-8 is the world's most capable maritime patrol aircraft. It brings together a networked state-of-the-art mission system with next-generation sensors, and a reliable airframe with high-efficiency turbofan engines. The result is an affordable multi-mission aircraft with superior speed and unmatched capability. The P-8 is now ready to secure sea and shore around the globe.
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