



Frontiers

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NOVEMBER 2012 / Volume XI, Issue VII

Under the Big Sky

For Boeing employees in Montana,
the sky's the limit

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**



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 also features new TV and digital components such as www.boeing.com/tribute.

Page 6:



In June, 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.

Pages 12–13:



"Enduring Support" focuses on Boeing's training expertise and is one of several ads in a Boeing Defense, Space & Security campaign highlighting the capabilities Boeing brings to its customers. The ads appear in print and selected online business, political and trade publications.

Pages 14–15:



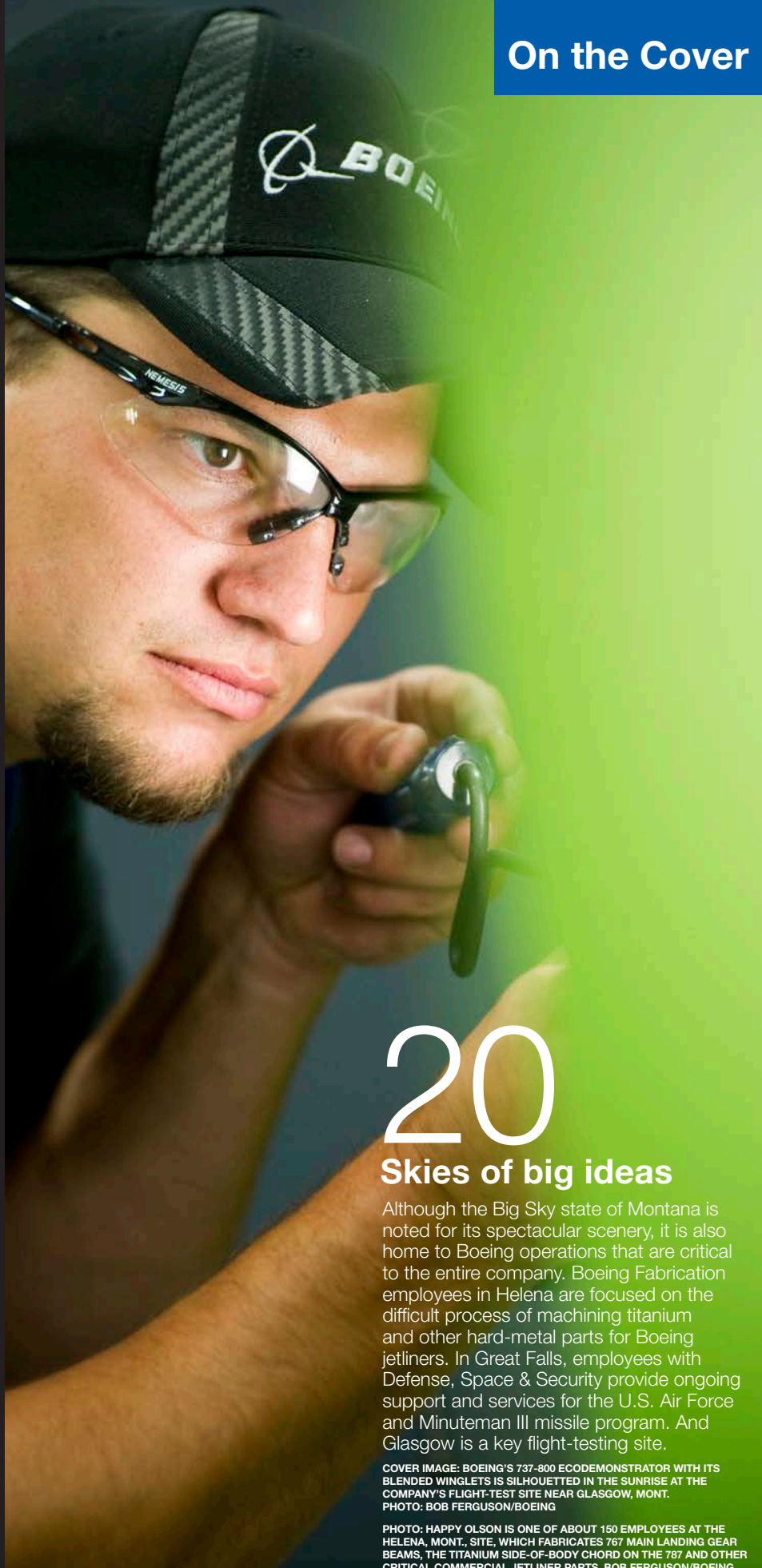
Underscoring key advantages of the Boeing 747-8 Intercontinental jetliner over the Airbus A380, this ad is running in domestic and international trade publications.

Back cover:



This ad highlights Boeing's Space Launch System, a heavy-lift launch system being developed with NASA that will support missions beyond low Earth orbit. The ad appears in trade publications.

On the Cover



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Skies of big ideas

Although the Big Sky state of Montana is noted for its spectacular scenery, it is also home to Boeing operations that are critical to the entire company. Boeing Fabrication employees in Helena are focused on the difficult process of machining titanium and other hard-metal parts for Boeing jetliners. In Great Falls, employees with Defense, Space & Security provide ongoing support and services for the U.S. Air Force and Minuteman III missile program. And Glasgow is a key flight-testing site.

COVER IMAGE: BOEING'S 737-800 ECODEMONSTRATOR WITH ITS BLENDED WINGLETS IS SILHOUETTED IN THE SUNRISE AT THE COMPANY'S FLIGHT-TEST SITE NEAR GLASGOW, MONT. PHOTO: BOB FERGUSON/BOEING

PHOTO: HAPPY OLSON IS ONE OF ABOUT 150 EMPLOYEES AT THE HELENA, MONT., SITE, WHICH FABRICATES 767 MAIN LANDING GEAR BEAMS, THE TITANIUM SIDE-OF-BODY CHORD ON THE 787 AND OTHER CRITICAL COMMERCIAL JETLINER PARTS. BOB FERGUSON/BOEING

FSC LOGO

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Historical Perspective

Boeing employees in Renton, Wash., are now producing more than one Next-Generation 737 every day. The lakeside site started 70 years ago as a U.S. Navy plant to assemble a long-range, flying-boat patrol bomber. Renton would continue on to make aviation history, including the B-29 bomber, the first military jet tanker and the 707 that ushered in commercial jet travel. PHOTO: BOEING ARCHIVES



Straight to the 'Bone'

Although developed to carry nuclear weapons during the Cold War, the Rockwell B-1 bomber, also known as the "Bone," has become a mainstay of the U.S. military's long-range bomber force, performing vital missions in Iraq and Afghanistan. The U.S. Air Force recently awarded Boeing a contract to outfit the bomber with cutting-edge technology that will keep it flying for years to come. PHOTO: U.S. AIR FORCE



Delivery day

Take a behind-the-scenes look at what happens in the weeks and days leading up to delivering a new 737 to a customer. Follow the journey of a 737-800 for airline customer flydubai from final assembly to delivery day at Boeing Field in Seattle. PHOTO: JIM ANDERSON/BOEING

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34 Designing the future

On shelves deep in the Boeing archives, dust covers dozens of small airplane models that reflect the design evolution of airplanes that eventually became production Boeing jetliners. These models provide insight into the complex process of designing future versions of the 777 and 787.

PHOTO: MARIAN LOCKHART/BOEING



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When duty calls

Recently, 20 Boeing employees who are military veterans gathered in Los Angeles to be featured in the company's new Veterans Day TV ads and videos, which debut this month. *Frontiers* spoke with some of these men and women about their memories, experiences and what they learned while serving their country.

PHOTO: BOB FERGUSON/BOEING

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As Boeing approaches its 100th anniversary in 2016, it must commit to doing business better than ever, says Bob Verbeck, vice president and chief financial officer for Defense, Space & Security. This will create future growth opportunities for Boeing—and for employees.

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Milestones in Innovation

The history of
Boeing innovation
is now at your fingertips.

The first official Boeing app for iPad is here. Enjoy this beautiful digital coffee-table book that showcases 96 years of breakthrough innovations with the swipe of a finger.



Available on the
App Store



Staying ahead of change

Why market-based affordability is important to BDS—and Boeing

Bob Verbeck

Vice president and chief financial officer, Boeing Defense, Space & Security

It's no secret that fundamental change is under way around the globe, and with it will come a period of change in the aerospace industry. The headlines trumpet daily the scope of challenges facing us: federal discretionary and national security spending cuts, an evolving global security threat, a halting economic recovery in the U.S. and a persistent financial crisis in Europe.

These external challenges are creating a new normal—one that includes smaller federal budgets, tougher government customer requirements and even greater public scrutiny of all our programs and services—and our task at Boeing Defense, Space & Security is to adapt to these new realities.

Among our most significant challenges is to reduce costs so Boeing becomes the best price bidder for business we target.

The good news is that we have a solid start on evolving the business. We anticipated many of the changes accompanying tighter budgets and are working to shape the future rather than merely react to the change.

BDS' market-based affordability initiative is the key going forward to providing crucial defense capabilities for our customers at competitive prices. The initiative is about doing business better by listening to the customer's specific requirements, understanding how the market values our products and services, and putting specific financial targets in place to win the business.

Why is this important to Boeing employees? All federal spending is under severe downward pressure. For example, unless Congress and the president act before Jan. 2, the second phase of deficit reduc-

tion under the Budget Control Act of 2011 will cut nearly \$500 billion in U.S. defense spending alone over the next nine years, with sequestration—or cuts—of nearly \$55 billion between January and October 2013.

These spending reductions are layered on the \$500 billion in Pentagon budget cuts already mandated by the Budget Control Act. We thus face the possibility of nearly a \$1 trillion reduction in defense spending over the next 10 years in addition to other potential discretionary budget cuts to NASA,

“It's critical that we stay ahead of the challenges so we can continue to invest in our future.”

the Department of Homeland Security and the Federal Aviation Administration, among others.

We have been making the changes necessary to compete and grow in this environment. Throughout BDS, we continue to simplify the business as we streamline and reduce costs in all our operations so we can deliver the same or better quality at a lower cost to the warfighter.

Where we have good financial performance, we are not only reducing costs to customers but also investing back into the business by adding to new business funds, independent research

and development, and capital investments. In addition, we are investing in ways to develop our team, such as boosting the effectiveness of first-line managers and rewarding high-performing employees.

It's critical that we stay ahead of the challenges so we can continue to invest in our future. Our market-based affordability initiatives will make us more competitive now while paving the way for technology investments so new defense products will be ready when the market recovers.

This focus on competitive affordability has already helped Boeing win key programs such as the KC-46A Tanker, the company's first international cybersecurity contract and a four-satellite order from Asia Broadcast Satellite and Satélites Mexicanos for the recently introduced 702SP satellite platform.

As we approach Boeing's 100th anniversary in 2016, we must commit to doing business better than ever. All of us at Boeing have to focus on delivering our products on time and on schedule and work with our customers to deliver solutions that meet their requirements. This will create future opportunities for employees and long-term performance and growth for our shareholders, our supply chain partners and the communities where we live and work. ■

PHOTO: BOB FERGUSON/BOEING

Snapshot

DREAM START: A water cannon salute greeted an ANA (All Nippon Airways) 787 Dreamliner after landing at Sea-Tac Airport on Oct. 1, marking the start of daily service with the 787 between Tokyo and Seattle. ANA was the launch customer for the 787. Last month it exercised options for 11 787-9 models, the longer version of the Dreamliner for which customers are scheduled to begin taking deliveries in 2014. Including those airplanes, ANA has ordered 66 fuel-efficient 787s to support expansion of international and domestic routes. The 787 features cabin improvements for passengers, as well as composite fuselage technology that saves weight and reduces fuel use. **PHOTO: JIM ANDERSON/BOEING**



Quotables

“Welcome to the Starship Enterprise.”

– Dave Lundy, a pilot for United Airlines, to a crowd of fellow pilots, flight attendants and other airline employees in Houston upon arrival with the airline’s first 787. Lundy flew the delivery flight there from Seattle. *Houston Chronicle*, Sept. 29

“The last generation of B-52 pilots has yet to be born.”

– Lt. Gen. James Kowalski, commander of U.S. Air Force Global Strike Command, speaking at a celebration in Wichita, Kan., on the 50th anniversary of the last B-52 bomber that rolled off the assembly line there. Planned upgrades could keep the adaptable B-52 flying for many more years. *Boeing News Now*, Sept. 24

Data driven

Flight testing an airplane requires lots of planning—and generates tons of information

By Steven B. Brown

Steven Brown is a lead instrumentation engineer in Boeing Test & Evaluation in Seattle. In this *Frontiers* series that profiles employees discussing their jobs, Brown talks about the importance of teamwork in collecting impeccable flight-test data. PHOTO: MARIAN LOCKHART/BOEING

Every day in flight test we ensure Boeing airplanes are the safest and most efficient to fly. My team works with design engineers to collect flight-test data that they can use to continually improve Boeing products.

It can be challenging work. Some days it means diligently checking the performance of thousands of airplane system components while at cruising altitude. Other days it means monitoring systems while the airplane flies in ways that would spill a lot of coffee if paying customers were on board.

Today's technology allows us to collect and analyze hundreds of times more data than when I started at Boeing 23 years ago. So much data that we remove all passenger accommodations to make space for our equipment and build our own in-airplane intranet. We install thousands of sensors and run wires to every part of the airplane.

We integrate flight-test modifications as the test aircraft rolls down the assembly line. Our goal is a "test-ready airplane" at first flight. One of my jobs is to get everything installed and checked with minimum impact to the factory production team.

This requires an enormous amount of planning and cooperation between the flight-test team and our factory colleagues.

I'm looking forward to working on the 737 MAX. We have learned a lot from our work on the 787-8 and 747-8 programs, which we will apply to the MAX. It will be a great challenge because our production teammates will be building 42 737s a month while the first MAX is being assembled. We've already begun coordination and planning earlier and with more detail than ever before.

My learning began long ago. I was only 22 years old when I joined Boeing prior to the 777 program. I remember my first day sitting in a cubicle with engineers whose experience included the 707 and Apollo programs. I am thankful to them for creating an environment that expects and delivers great products. Years later, I can't go a day without thinking of what they taught me and their examples of excellence. Now I have the honor of working with some incredibly talented young people, and I work to live up to the example and expectations of the great engineers before me. ■

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Making history

For 70 years, Boeing Renton employees have pushed the frontiers of aviation

By Mike Lombardi

In September 1941, with war raging in Europe, ground was broken for a new factory on the shores of Lake Washington at Renton, Wash., which had been selected by the U.S. Navy as the assembly site for Boeing's Sea Ranger, a long-range patrol bomber.

But as World War II progressed, the Navy began to rely more on land-based multi-engine patrol aircraft rather than flying boats, and the PB2B Sea Ranger program was canceled.

It was, however, not the end of the Renton site. In fact, it was just getting started.

Over the next 70 years, Boeing employees in Renton would make some of the greatest advancements in aviation, including the first air-refueling tankers and the first successful commercial jetliner. And today, Renton employees are building more than one Next-Generation 737 every day, using one of the most advanced production systems in the world.

The Navy initially built and owned the Renton plant, but following the cancellation of the Sea Ranger it changed hands.

The U.S. Army Air Force was looking for a site to build what would become the most technologically advanced airplane of the war—the Boeing B-29 Superfortress bomber. The two services



The system devised to assemble the B-29 was one of the most modern in the world, making it possible for Renton workers to achieve a production record of 160 B-29s during July 1945.

PHOTOS: (Top) The Renton, Wash., plant at the height of production during World War II. The five B-29s outside the factory doors represent a single day's production. **(Above)** The assembly process for B-29s at Renton featured four moving lines that assembled finished sections constructed off-site—much like assembly for the 787 today. **BOEING ARCHIVES**

struck a deal: The Renton site was handed over to the Army Air Force, and in return the Navy received 700 Kansas-built North American B-25 Mitchell bombers.

The Army constructed an airfield next to the plant, and on Dec. 30, 1943, a B-29 called the “Renton Girl” became the first of thousands of Boeing planes to make their first flight from the airfield. The production system devised to assemble the B-29 was one of the most modern in the world, making it possible for Boeing workers in Renton to achieve an amazing production record of 160 B-29s during July 1945.

After the war the plant reverted to government use, but Boeing returned in 1949 to build the C-97 Stratofreighter and later the KC-97, the first production aerial refueling tanker.

Next came one of the most important airplanes in aviation history. Boeing model number 367-80, or the “Dash 80” as it would be called, rolled out from the Renton plant in 1954 and was christened by Bertha Boeing, wife of company founder William Boeing.

The Dash 80 led to two different airplanes: the Air Force KC-135 Stratotanker, the first jet tanker, and the 707. Although the British De Havilland Comet was the world’s first commercial jet transport, it was not a success. The 707 was, and it ushered in the new age of commercial jet travel.

Renton produced every 707 and KC-135. The plant also built all of the 727 commercial jets that followed, the first of which rolled out 50 years ago this month, in November 1962. That same year Boeing purchased the Renton plant from the Air Force.

In 1970, in response to a severe economic downturn, all single-aisle airplane programs were consolidated in Renton, including the 737, which was moved from the Thompson site on Boeing Field. The same economic downturn led the company to try a number of diversification programs, including hydrofoil boats. Renton built six USS *Pegasus*-class hydrofoil missile ships for the U.S. Navy, as well as 24 commercial jetfoils.

The airplane business turned up in the 1980s and Renton launched the single-aisle 757. Along with the Everett-built twin-aisle 767, these jets introduced the two-pilot “glass cockpit” to commercial jetliners, referring to the flight deck’s use of more automated, electronic flight instrument displays.

Today, the Renton site continues to make history. Nearing 10,000 deliveries, the 737 will soon pass the production record of the legendary DC-3. Douglas produced 10,629 DC-3s and its military variant the C-47.

Renton also is producing another aircraft in the original building built by the Navy in 1941. This 737-based military derivative is the P-8A Poseidon, a submarine hunter and maritime patrol aircraft. After 70 years, the historic plant is finally building long-range patrol planes for the U.S. Navy. ■

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Nearing 10,000 deliveries, the 737 will soon pass the production record of the legendary DC-3.

PHOTOS: (Top) The first of 1,050 Boeing 757s rolls out of the Renton, Wash., plant. **(Above)** U.S. Navy *Pegasus*-class hydrofoil missile ships under construction at Renton. BOEING ARCHIVES

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TODAY TOMORROW BEYOND

 **BOEING**

THE NEW
747-8
INTERCONTINENTAL



YOUR 747-8 INTERCONTINENTAL ADVANTAGE.

26%
cost advantage

The 747-8 has a 26% trip cost advantage over the A380. That means airlines can operate the 747-8 on a 6,000-nmi route plus six 737-800s on 400-nmi routes for the cost of operating one A380 on a 6,000-nmi route.

8%
more efficient

Based on data available as of August 2012
A380 is a trademark of Airbus SAS



With a new wing and new engines, the new 747-8 is 8% more fuel efficient per seat as compared to the A380 and emits 45,000 fewer tonnes of CO₂ per year, which is equal to taking 9,000 cars off the road.

30%
more cargo

The new 747-8 delivers more revenue cargo volume. It would take four A380s to carry the same amount of revenue cargo as three 747-8 Intercontinentals.

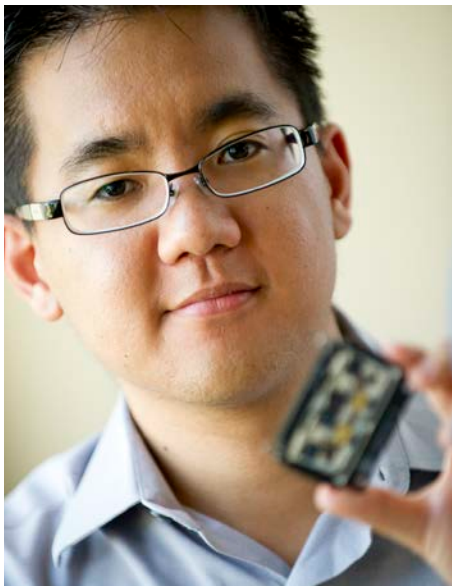
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 **BOEING**

Analyze + this

Boeing's nonunion health care plans for 2013 give employees new options for managing costs

By Alex Wilson



Fumito Kobayashi is probably like a lot of employees who are considering the options for medical coverage since Boeing announced changes to the nonunion medical plans in June.

Kobayashi, 25, an unmarried electrical engineer at Boeing Defense, Space & Security in Huntington Beach, Calif., is considering participating in the new Advantage+ health plan. He believes he could benefit from an important feature—the \$600 contribution Boeing would make for eligible employees into an associated Health Savings Account starting in January.

In good health, Kobayashi rarely visits the doctor and expects his medical expenses will stay low over the next few years. That means the money Boeing

puts in the Health Savings Account annually would add up, as any unused funds from the previous year roll into the next. When the savings hit \$2,000, they can be invested in select mutual funds.

Kobayashi said he's also drawn to the Advantage+ plan because for him there will be no paycheck contribution. He can take the money he would contribute—about \$500 in 2013 for the Traditional Medical Plan—and deposit it on a federal tax-free basis into his Health Savings Account.

He can also take the money in his Health Savings Account with him if he ever decides to leave Boeing.

The Advantage+ plan replaces the company's PPO+Account plan.



“When I started the PPO+Account, I looked at it as a way to get free money. And every year, I’ve always had money carry over.”

– Kelly Wright



McCrea plans to use tools available to employees during annual enrollment beginning Nov. 5 to determine the best plan for him and his family.

Kelly Wright, a 14-year Boeing veteran and mother of two, has been covered by the PPO+Account plan since it was offered by Boeing and estimated she has saved around \$12,000 from the money Boeing has put into her Health Savings Account.

“When I started the PPO+Account, I looked at it as a way to get free money,” said Wright, a Human Resources manager in Washington state. “And every year, I’ve always had money carry over.”

This included having both of her children, now in their mid-20s, on her medical plan while they were eligible.

Her advice to employees who are considering the Health Savings Account is to plan medical expenses when possible.

“You can do it with small children, because preventive care is covered,” Wright said. “But with the deductible, it’s important to be strategic about when to schedule surgeries or procedures.”

That’s food for thought for Scott McCrea, a 59-year-old Information Systems Security manager for Shared Services Group in Seal Beach, Calif., who is still considering the best medical plan for him.

McCrea expects that even with the \$1,200 for family coverage Boeing gives eligible employees with a Health Savings Account, the Traditional Medical Plan could be a better choice, despite its paycheck contributions.

“I expect we’d be in the deductible pretty quickly,” McCrea said of the Advantage+ health plan.

His 16-year-old son and wife are covered by his medical plan, and for McCrea, health expenses can be unpredictable. His best guess is a medical bill between \$1,800 and \$2,500 in each year.

McCrea said he’s undecided, and he plans to use tools available to employees during annual enrollment beginning on Nov. 5 to determine the best plan for him and his family.

The tools include a Medical Expense Estimator, a Health Plan Comparison Chart and a Health Care Cost Summary. (See chart.)

“Those tools provide the information necessary to estimate how much each plan will cost for each employee for the next year,” Stephens said. “We try to individualize the process and make sure



employees have the exact information they need to make the best choice for their situation.”

Annual enrollment will continue through Nov. 30. During this time, all Boeing employees will have the opportunity to check into next year’s plans, do their research and find the best fit for them, Stephens said. ■

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PHOTOS: (Clockwise from far left) Fumito Kobayashi, Scott McCrea. PAUL PINNER/BOEING Kelly Wright. MARIAN LOCKHART/BOEING

Health care tool	How it helps
Medical Expense Estimator	Compares plans and estimates your medical costs for 2013, with side-by-side estimations of the bottom-line costs (based on 2011’s full calendar year of claims data, if available).
Health Plan Comparison Chart	Provides information on copayments, coinsurance for office visits, prescription drugs and more with a side-by-side comparison of how each plan covers services and supplies.
Health Care Cost Summary	Summarizes an employee’s health care claims, including what the employee paid.
Flexible Spending Account Calculator	Shows the amount that an employee could contribute to his or her flexible savings account, or FSA, to help pay health care expenses.
Health Savings Account Value Estimator	Helps calculate how much eligible employees enrolled in the Advantage+ health plan can contribute to a related Health Savings Account to help pay qualifying expenses today and save in the account for future qualifying expenses.

All of these tools are available through Boeing TotalAccess. From the TotalAccess home page, click on My Health & Insurance, select the Manage My Benefits tab and click on Your Benefits Resources.



STILL THE ONE

The capabilities of the B-1 are growing, and so is its role as a long-range conventional bomber

Aircrews affectionately refer to it as the “Bone,” a play on the fast and sleek bomber’s name.

But the B-1 (B-One) has truly become the backbone of the U.S. long-range bomber force and has seen combat almost continuously since 2001. Earlier this year, the B-1 fleet performed its 10,000th combat mission, in support of ground operations in Afghanistan.

Not bad for a bomber originally designed to carry nuclear weapons and which seemed irrelevant after the end of the Cold War. Instead, the B-1 Lancer became a workhorse in Iraq and then Afghanistan. And its role as a conventional bomber, with the speed and range to fly very long distances fast, is growing as the U.S. military shifts its focus from Afghanistan.

During Operational Iraqi Freedom, B-1s dropped 40 percent of all weapons in the war while flying only 5 percent of

the sorties; the aircraft has dropped about 60 percent of the weapons in Afghanistan, according to the U.S. military.

A recent article in *USA Today* about the importance of the B-1 noted that with a top speed of more than 900 mph (1,480 kilometers per hour), the B-1 can streak across the width of Afghanistan in about 45 minutes, a lifesaving capability when ground forces need immediate air support.

And the B-1 is going to get even better.

Designed and built by Rockwell, one of Boeing’s heritage companies, ongoing modifications to the B-1 will make it more capable.

The U.S. Air Force recently awarded Boeing a contract to outfit an additional nine B-1s with an upgraded Integrated Battle Station, which includes updating the front and aft cockpit. Pilots will have new flat-panel displays, data link communications and improved situational awareness. A new diagnostic system will

monitor the health of the bomber during flight. Boeing employees will provide engineering support for the upgrade work at Tinker Air Force Base in Oklahoma City. The entire B-1 fleet is scheduled to be upgraded by the end of 2019.

Although the B-1 entered service with the Air Force in 1985, the upgrades will ensure it has the latest technology to perform whatever missions are required for many more years.

The B-1 was modified to carry conventional weapons after the Cold War ended. It can carry many more bombs and missiles than any other airplane in the Air Force inventory. A typical B-1 payload is 24 2,000-pound (900-kilogram) Joint Direct Attack Munitions, or JDAMs. It also has the capability to destroy moving targets with laser JDAM weapons.

Today, the B-1 fleet numbers 63 aircraft, based at Dyess Air Force Base in Texas and Ellsworth Air Force



Base in South Dakota.

The bomber has a crew of four; its wings sweep back for high speeds. A key feature is its terrain-following radar that enables the bomber to fly at very low altitudes to avoid detection.

That ground-hugging capability has come in handy for nonlethal “show of force” missions in Afghanistan to avoid injuring civilians. With the bomber’s four powerful engines on full afterburner, the B-1 can make high-speed, low-level passes over unsuspecting Taliban fighters.

As one B-1 pilot explained, “It gets their attention.” ■

For more about the B-1, see Page 11 of the June 2010 issue of Frontiers.

PHOTOS: (Far left) A B-1 flies a combat mission over Afghanistan in support of Operation Enduring Freedom. The bomber has the capability to deliver large quantities of precision and non-precision weapons against specific targets. **(Insets, from left)** Its wings swept back, a B-1 makes a high-speed pass in September during a firepower demonstration at the Nevada Test and Training Range; crew chiefs wait for a B-1 aircrew to complete system checks before takeoff at an air base in Southwest Asia; a B-1 receives fuel over Afghanistan from a KC-10 tanker. **U.S. AIR FORCE**

BIG SKY VISION



Boeing's Montana operations provide critical high-tech services and fabrication

By James Wallace

HELENA, MONT.



“Once you live in Montana you never want to live anyplace else.”

— Robin Lock, Fabrication specialist

ASSOCIATED PRESS

Robin Lock doesn't mind getting her hands and clothes dirty, at work anyway.

She does heavy metal grinding and hand finishing at Boeing's Fabrication site in Helena, Mont., and she loves her job—and living in Montana.

Recently, when she took her car to a mechanic, he asked why she was so dirty. She explained she had just gotten off work. At Boeing.

“Oh, that's right, Boeing is in Helena now. Guess you will be moving to Seattle pretty soon,” he kidded, referring to Washington state where Boeing builds jetliners.

Not a chance, Lock said in an interview. “I'll never leave Montana.”

She loves Big Sky Country, as Montana is sometimes called, an outdoor recreational paradise in winter and summer. It's a state famed for big blue skies, towering, snow-covered mountains and vast rolling plains,

for wild rivers and picturesque lakes, for national parks and dude ranches, for wide-open spaces and lonesome highways, a state slightly bigger than Japan that shares a long border with Canada and where cowboys still drive cattle up into the mountains to feed on summer grasses.

But Boeing is not there because of the scenery, as spectacular as it is. The company's operations in Montana are high-tech, from flight-testing new technologies that help shape the future of flight to cutting-edge manufacturing with hard metals such as titanium.

Some 200 employees with Commercial Airplanes and Defense, Space & Security call Montana home. They fabricate parts for Boeing jetliners, including the 787, and provide services and critical support to the U.S. Air Force and the Minuteman III missile program.

And employees with Boeing Test & Evaluation can usually be found at a remote site in northeast Montana—Glasgow—when Boeing jetliners are tested.

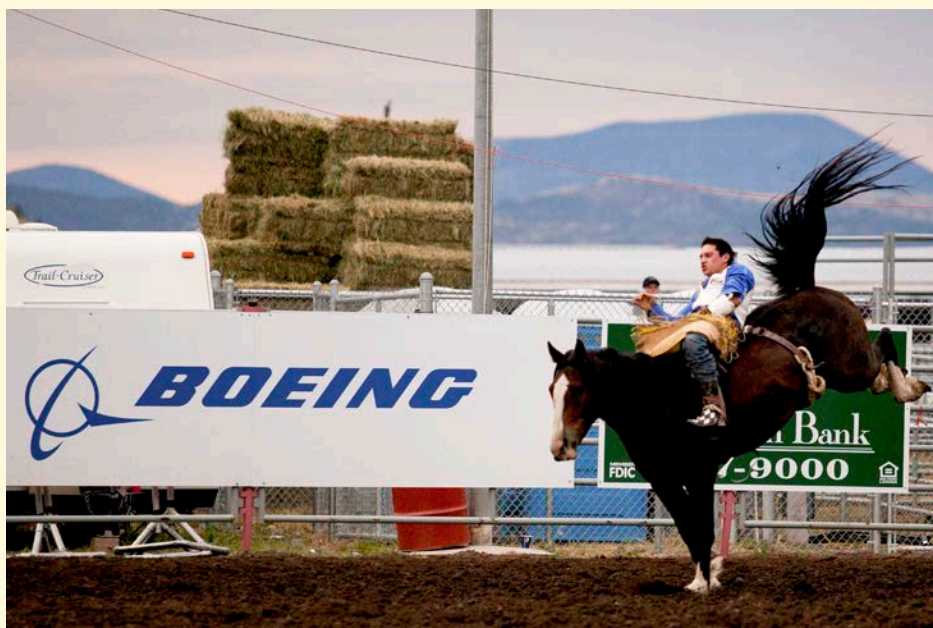
Across the state are also dozens of Boeing suppliers and vendors.

Boeing Helena is focused on manufacturing titanium and other hard-metal parts for Boeing 7-series jetliners. Those parts include 767 main landing gear beams. The site also roughs the main landing gear for the 737, with the finishing work performed at Boeing Fabrication in Portland, Ore. And Helena co-produces with Portland the titanium side-of-body chord for the 787.

That chord for the Dreamliner underscores the complex, hard-metal machinery capabilities of the Boeing team in Helena. It's a part that attaches the wing to the airplane body. The side-of-body chord starts out as a 5,400-pound (2,450-kilogram) chunk of titanium. When this single piece is milled down into the actual 787 part, it weighs 250 pounds (110 kilograms).

Lock hand-finishes hard-metal parts after they come off the manufacturing machines.

“It's perfect for me,” she said. “I've always liked to get a little dirty and I've



PHOTOS: Glasgow, Mont., in the early morning. BOB FERGUSON/BOEING Boeing has a growing presence in the Helena community, as evidenced by its sponsorship of Helena's Last Chance Stampede rodeo in July. DANIEL THOMPSON/BOEING



PHOTOS: (Top and middle) Tyler Blanton, Fabrication specialist, prepares a 787 side-of-body chord for installation; a 787 side-of-body chord progresses through the cutting process. **BOB FERGUSON/BOEING (Above)** Fabrication specialists Carl Cleveland, left, and Robin Lock hand-finish a 787 side-of-body chord to final specifications. **ASSOCIATED PRESS (Far right)** Matt Roddewig, Fabrication specialist, removes a 787 titanium edge frame from a computer numerical control milling machine. **BOB FERGUSON/BOEING**

always been a hard worker. I enjoy the hands-on physical work.” She moved to Montana from the East Coast at age 15 and never left, other than for a short time to live in North Dakota.

“Once you live in Montana you never want to live anywhere else,” she said, mentioning her love for hunting, fishing, camping and picking wild huckleberries, a Montana favorite.

Lock has worked at the Helena site for seven years, all the while helping make parts for Boeing airplanes. It was Summit Aeronautics Group when she started. Boeing acquired Summit in December 2010 to support higher jetliner production rates and has added people and new machinery. About 150 employees now work at the site.

Before she joined Summit, Lock worked in a small engine shop in Helena.

Even though Summit significantly expanded its operations over the 13 years it was in Helena, having started with only a handful of employees, and Boeing has added people since it acquired Summit, Lock said it still has that “smaller-company Montana attitude.”

“We are all one big family,” she said. “Everyone knows everyone by their first name, what they drive and if they need help with anything.”

And Boeing is becoming an important corporate citizen of Helena, the state capital, Lock added.

Since the acquisition of Summit, Boeing has made charitable contributions to several Helena organizations and Boeing employees often participate in community events. And Boeing sponsored the Last Chance Stampede rodeo in Helena this past summer.

While Boeing is a new neighbor in Helena, the company, its employees and its airplanes have been a part of the Great Falls area far longer.

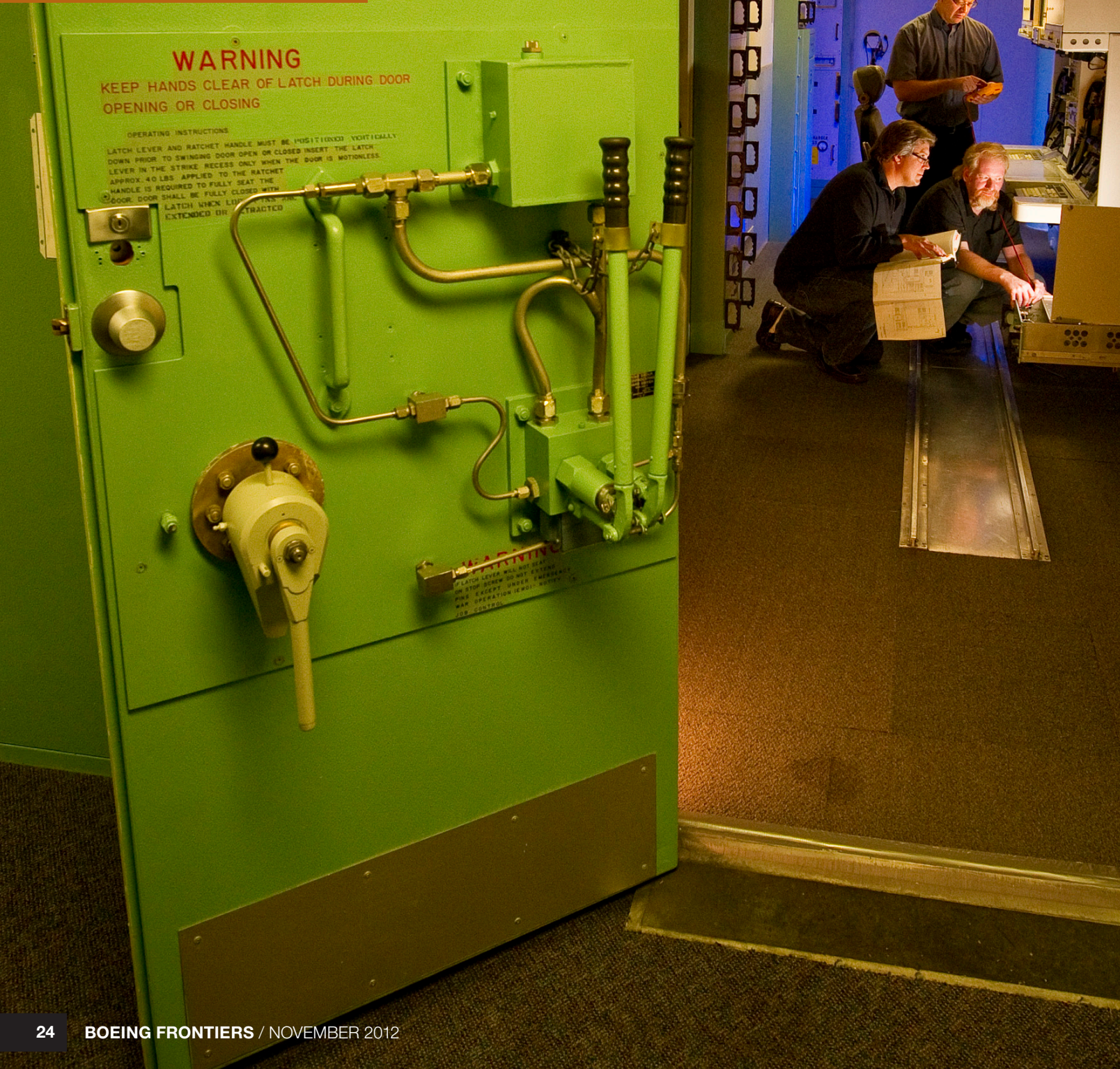
Great Falls, about 90 miles (115 kilometers) northeast of Helena, is the home of Malmstrom Air Force Base. During World War II, several Boeing B-17 bombardment groups trained there at what was then the newly constructed Great Falls Army Air Base. Over the years, many different Boeing-built fighters, bombers and tankers have been based at Malmstrom.

Fifty years ago, in 1962, something else made by Boeing arrived at Malmstrom—by railcar. It was the new three-stage Minuteman I, the country’s first solid-propellant intercontinental ballistic missile. This was during the Cold War, and eventually Malmstrom would have the largest Minuteman missile wing in the

The Boeing
Fabrication site in
Helena is focused
on manufacturing
titanium and other
hard-metal parts
for Boeing 7-series
jetliners.



Most of the Boeing employees in Great Falls were in the Air Force, where they had hands-on experience with the Minuteman.





GREAT FALLS, MONT.

“The simulator is so realistic that Boeing tries to hire people with real weapons system experience.”

– Fred LaTaille, training device technician



PHOTOS: (Left) Don Wright, standing, site manager, and training device technicians Chris Krueger, foreground left, and Fred LaTaille in the Missile Procedures Trainer at Malmstrom Air Force Base. **(Top and above)** A control panel and a simulated Minuteman warhead in the launch facility.

BOB FERGUSON/BOEING

United States, with some 200 missile silos spread over 23,500 square miles (61,000 kilometers) of Montana.

Today, Malmstrom has about 150 Minuteman III missiles, the most advanced version. Boeing Defense, Space & Security employees support those missiles and the Air Force at Malmstrom. In addition to field support, the Boeing employees maintain and upgrade the simulators at Malmstrom used to train Air Force personnel on the Minuteman.

Chris Krueger has worked for Boeing in Great Falls for about two and a half years. But he was at Malmstrom for about six years before he joined Boeing, as a master sergeant with the Air Force.

Most of the Boeing employees in Great Falls were in the Air Force, where they had hands-on experience with the Minuteman.

“The simulator is so realistic that Boeing tries to hire people with real weapons system experience,” said Krueger’s friend and fellow Boeing employee Fred LaTaille, who was also in the Air Force and stationed at Malmstrom.

He and Krueger help maintain both the Minuteman III launch control and launch console trainers at Malmstrom.

LaTaille, who has been in Great Falls 13 years, pointed out that the 150 or so Minuteman III missile silos cover an area about the size of the state of West Virginia, and some of the Air Force personnel who train on the simulators maintained by Boeing have to drive up to four hours to get to the base, often in harsh weather during Montana’s cold and snowy winters.

Both men said they enjoy the missile-related work they do for Boeing, as well as living in Montana.

“I love it here,” said Krueger, who enjoys downhill skiing in winter.

LaTaille mentioned Montana’s famed hunting and fishing.

And if you love airplanes, LaTaille added, there’s a side benefit to living in Great Falls. Boeing’s newest jetliners, the 787 and 747-8, sometimes land at the airport there. The area can be windy, and landing a new jetliner in a severe crosswind is part of the flight-test program.

Even more flight testing of Boeing aircraft takes place about 250 miles (400 kilometers) east, at a remote airfield near Glasgow. The airfield was used to train B-17 pilots during World War II, and later, in the 1960s, a B-52 strategic bomb wing was located there, at what by then was Glasgow Air Force Base. The base closed in the 1970s and much of the property was purchased by Boeing as an aircraft test facility. Today, the site is maintained by Montana Aviation Research Co., a Boeing subsidiary.

“It has its challenges, but just about everything we need we can find in Glasgow,” said Darcel Wesen, one of eight employees at Montana Aviation who work at the site year-round.

Recently, Boeing flew its 2012 ecoDemonstrator, a new 737-800, to Glasgow to test technology that will improve aircraft fuel burn, reduce engine noise and lower carbon dioxide emissions.

Boeing flight-test personnel from Boeing Test & Evaluation came to Glasgow from Seattle for the ecoDemonstrator testing.

“We have 52 beds, and they were all full,” said Wesen, the airfield and site manager.

Wesen was born in Montana and has lived there her entire life. She loves airplanes. Her dad was a pilot, and her uncle was chief pilot for

**Boeing flew its
ecoDemonstrator
to Glasgow to test
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and reduce noise
and emissions.**





GLASGOW, MONT.

“It has its challenges, but just about everything we need we can find in Glasgow.”

– Darcel Wesen, Glasgow airfield and site manager, Montana Aviation Research Co.



Montana’s Fish and Game Department, she said. They sometimes took her flying, though she is not a pilot.

Now she gets to be part of the testing of Boeing jetliners at Glasgow.

“That’s the fun part, when the planes come in,” she said.

Even though this northeast corner of Montana is remote, Wesen has no complaints.

“If you like the outdoors, you will love living in this part of Montana,” she said.

Krueger, the Boeing employee in Great Falls, can’t imagine living anyplace else. He fell in love with Montana years ago, when he was 18 years old. He was driving from his home in San Jose, Calif., to his first Air Force duty assignment, and the trip took him through Montana.

“It was one of those picture-perfect Montana days—mountains with snowcaps and green meadows at sunrise,” Krueger recalled.

“This was the place I knew I had to be.” ■

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For more on Boeing’s flight testing in Glasgow, see Page 20 in the October issue of Frontiers. Employees may learn more about Boeing Helena’s integration into the company in Boeing News Now at <http://boeingnews.web.boeing.com/archive/2012/2211.html>

PHOTOS: (Clockwise from far left): The 2012 ecoDemonstrator on the main runway at Glasgow; Boeing subsidiary Montana Aviation Research Co. manages the site; Boeing employees check an eco-Demonstrator engine; the ecoDemonstrator flies over the Glasgow area. BOB FERGUSON/BOEING



A behind-the-scenes look at how Boeing delivers 737s to customers

By Dawsalee Griffin and photos by Jim Anderson

A few days before delivery of its latest Next-Generation 737, a team from low-cost carrier flydubai arrived in Seattle.

A not-infrequent event, this month the team consisted of Mick Hills, divisional head, Engineering & Maintenance, Dave Lewis, Engineering manager, and Jamie Briant, Maintenance controller. Over the course of the next week, they will inspect the airplane, sign ownership paperwork, get the ceremonial keys and take possession of their new 737-800.

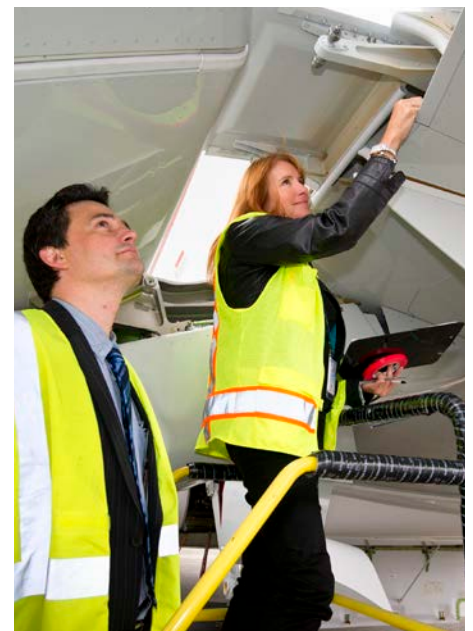
They have fine-tuned the process.

"We've worked with Boeing to create a process that works for us whether we take a lot of airplanes in a short period or several months apart," Hills said.

While the customer delivery process is fairly straightforward for everyone who buys a new Boeing airplane—customer test flight, inspection, delivery preparation and flyaway—the execution can vary from one customer to another.

"The challenge is to meet a specific customer's expectations and needs," said Tom Greenside, 737 delivery center manager. "And that can range from supplying

The delivery





PHOTOS: Completed 737 wings are ready to be joined to the body of the airplane; Brenda Thepvangsa, 737 interiors mechanic, installs the seat cable raceway, which houses and protects entertainment system cables that run along the floor and are connected to the seats; Barry Clegg, left, of Pembroke Leasing and Leona Lyon, 737 Customer Quality Support, inspect flydubai's latest 737-800; 737 painter Jake McClain applies finishing touches to the paint scheme of flydubai's 737-800; Warren Lew, 737 interiors installation mechanic, adds Boeing Sky Interior sidewalls to a flydubai 737-800.

ery



Boeing pilots for the test flight to working pop-up issues quickly.”

It also means being willing to listen and learn from the customer.

“Boeing understands how we work and what we require in the delivery of new aircraft and has worked with us to streamline the process,” Hills said.

That close relationship developed gradually over the three years that flydubai has been accepting Boeing airplanes.

Upon arriving in Seattle, the team stays in touch with its Boeing contact, Ted David of 737 Customer Quality Support. David will be part of the customer team until the airplane flies away. He'll make sure there are no surprises, reporting regularly as the plane moves through production and delivery.

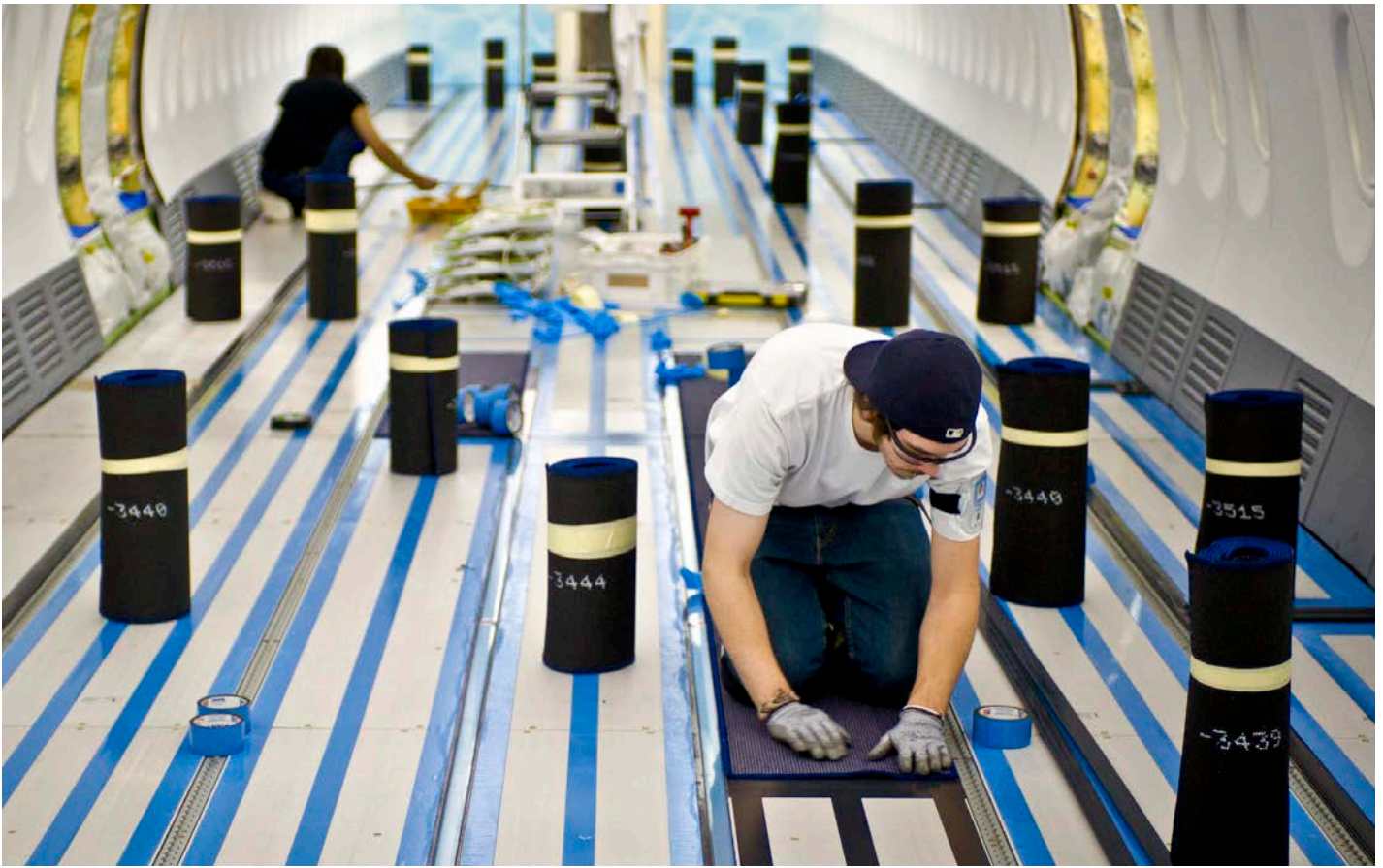
Each customer has a Boeing support coordinator assigned to monitor and inspect the airplane during assembly and testing, and to work with Quality, Production and others to ensure any issues are resolved before delivery.

Airline flydubai wanted an efficient process to support specific delivery requirements of its team, which is based in the United Arab Emirates. Among the services flydubai takes advantage of is the use of Boeing pilots to fly the customer test flight, something that enables part of the airline's team to arrive in Seattle later in the process. Because there is no customer presence on the flight, David forwards the flight report to the team in Dubai.

Hills, Lewis and Briant spend most of their time in Seattle at the Commercial

“Boeing understands how we work and what we require in the delivery of new aircraft.”

– **Mick Hills, divisional head, Engineering & Maintenance, flydubai**



Inside flydubai

- Initial order July 2008 for 50 Next-Generation 737-800s
- First deliveries in May 2009—two 737-800s
- First commercial flight June 1, 2009, to Beirut
- Carried 1 million passengers in its first 13 months of operation
- Currently operates 25 airplanes, all 737-800s
- Launch customer for Boeing Sky Interior
- Recipient of Boeing's 7,000th 737
- Flies to more than 50 destinations across the Middle East, North Africa, Asia, Indian Subcontinent, Commonwealth of Independent States and Central & Eastern Europe
- Operates more than 950 flights a week

Delivery Center at Boeing Field, also known as the King County International Airport. The airport, just south of Seattle, is the site of all 737 deliveries.

The morning before the walk-through of its latest 737-800, the flydubai team meets in a large conference room with delivery center staff. Representatives from Customer Quality Support, Customer Engineering and other organizations are present to discuss any issues that have come up at the delivery center or during test flights. Boeing pilots are available to answer questions about the flights. By the time of this meeting, all the issues have been worked by David and the delivery center team.

Typically, David will accompany the flydubai team when it inspects the airplane. This time, Leona Lyon, 737 Customer Quality Support, helps out while David works with another customer also getting a 737.

The flydubai plane has been at Boeing Field since its first flight from the factory in nearby Renton. It was painted and then moved to a stall where mechanics

perform any last-minute adjustments.

The airline's team inspects the exterior of the airplane, including the paint, looking for any mechanical or aesthetic issues. Inside, team members open stow bins and closely inspect the carpeting, sidewalls, galleys and lavatories. They're looking for items that don't fit or work properly. Lyon is there to take notes on any issues and then resolve them with the delivery center team.

That's a goal at the delivery center, Greenside said. "We know what issues the customer found on the last airplane and if they are having any in-service issues—and pay special attention to those areas."

There aren't any issues with this airplane, so the next working day, about a week after they arrived in Seattle, flydubai executives meet with the Boeing team to complete formalities. The airplane is then towed to the delivery center for the final preparations before takeoff.

Six people work around a conference table as the teams go over contracts, review paperwork, and contact banks and regulatory agencies, including those in Dubai, before the airplane changes hands.

The second-floor conference room has a wall of windows that overlook the flight line where the flydubai 737-800 is parked.

Boxes of paperwork are stacked in the corner of the conference room. They contain flight manuals, readiness logs, pretty much the history of everything Boeing has done and knows about the airplane. The customer also receives the information on CDs and via the Web on MyBoeingFleet.

Getting to know customers and working closely with them is a particular focus for Seattle's Commercial Delivery Center, according to Greenside.

"We are always looking for ways to better support our customers throughout the delivery process," he said.

The delivery center team asks for feedback on every delivery. Within three days, the Delivery Center's Customer Quality Support manager addresses any issues raised.

Boeing is doing a good job gathering and responding to feedback, according to flydubai's Hills. That helped when the airline found issues with the first 737 delivered with the new Boeing Sky Interior.

"We were the launch customer for

the new interior," Hills said. "There was a commitment between us to quickly resolve any issues and Boeing did a good job responding to our concerns."

Ghaith Al Ghaith, chief executive of flydubai, underscored the "working together" relationship between Boeing and the airline.

"We are delighted with the way our relationship with Boeing has developed since we launched in 2009," he said. "We look forward to continuing this relationship with the team in the years to come."

"Keys" in hand, the flydubai delivery team, along with Boeing's David, watch the latest 737-800 in flydubai colors fly away. There will be more.

With 737 production rates at more than one plane a day, and going up, it's a delivery process that for Boeing will be repeated over and over. And each time better and better. ■

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PHOTOS: (Far left) Sean O'Connor, 737 interiors mechanic, installs carpeting on a flydubai 737. **(Below)** A flydubai 737-800 awaits delivery at Seattle's Boeing Field. Customers closely inspect details such as paint, seats, stow bins and galleys before the airplane is delivered.



Leading into the future

This is the final installment in a three-part series focused on Boeing's leadership development programs—and how graduates are using what they've learned on the job.

Frontiers recently discussed Boeing's leadership development road map with Norm Bartlett, vice president, Leadership Talent Management Organization Effectiveness; Diana Sands, Corporate controller; and Marc Allen, president, Boeing China.

Where does leadership development happen?

Sands: In today's work environment, everyone from the shop floor to the corporate office finds themselves working with others who don't report to them or their particular group. Yet, they have to work together to effect change. These are often opportunities to learn and demonstrate leadership skills.

Allen: For every leader, different experiences have different levels of relevance and impact on their growth. That's why it's critical we constantly think about all the different ways we're exposing and challenging ourselves and our teammates.

Bartlett: We can teach concepts and clarify expectations, but the actual true development is on the job. It is learning from mistakes, and it's emulating others who have done well.

Describe Boeing's future leadership pipeline.

Allen: Recruiting effectively and hiring right, at every level, are the most important things we all can do to have a positive impact on the leadership pipeline. It's a serious responsibility for everyone engaged in hiring. They simply have to identify and attract excellence for every position they are filling.

Sands: We can't wait until succession planning to learn we don't have the right people in place. We need to continually evaluate this and affect it. It starts early, before employees even join Boeing, as we develop relationships with strong candidates.

Why is that pipeline critical to our business?

Allen: As incredible as our technology is, at the end of the day our business is nothing more than the united combination of all our people and their talents. Nothing is a higher priority than maintaining a constant inflow of excellent and passionate people at every level. Our market leadership depends on it.



working together

growth skills creative learn trust expectations

Leadership

passion

inter



Nothing is a higher priority than maintaining a constant inflow of excellent and passionate people at every level.

Bartlett: Fifty thousand employees could potentially leave the company over the next five years through attrition and retirements, and we could likely hire 50,000 new employees. That’s an unbelievable challenge to absorb, and we will need to develop people more quickly than ever before. It is beyond important—it is basic to our survival.

How should Boeing leaders prepare for the future?

Bartlett: More than ever before, leaders must have good situational awareness, which includes more global awareness. I believe we will see greater employee movement between businesses, locations and programs to gain greater experience with cultural differences, leadership styles and our many products and services.

Allen: They will have to be nimble. They will have to be committed to building cultures of trust, creativity, careful thinking, risk-taking and integrity—all with a global orientation and a strong emphasis on “team.”

Sands: The new generations of workers come with different skills and expectations than the way many of us developed, grew up and progressed through our careers. They communicate through technology, and the speed in which they expect results is much greater. We and our future leaders will need to make career development conversations a priority that start early and are held often. ■

PHOTOS: (Clockwise from far left) Norm Bartlett. PETER GEORGE/BOEING
Diana Sands. BOB FERGUSON/BOEING Marc Allen. LIU ZHIJIAN/BOEING

experiences values successful
 er s h i p
 integrity engaged risk-taking effective challenging strong



MODEL

for the FUTURE

Design evolutions of the past show how Boeing engineers define the shape of planes to come

BY KAREN CRABTREE

The paint covering the fuselage is cracked with age and a fine layer of dust covers the base. A Boeing 7-series jetliner number is stamped on the tail, but this small airplane model, lined up with so many others on a Boeing basement storage shelf, doesn't look like any airplane parked at an airport gate or flying today.

But these models, some with unusual shapes and shelved away like so many discarded toys, have been essential to Boeing and its airplane designers of the past and offer lessons into designs of the future.

As Boeing engineers today give shape to the airplanes that will enter service later this decade—a bigger variant of the 787 family known as the 787-10X and a larger, improved 777 referred to as 777X—the sheer number of the tiny models that preceded each new Boeing airplane speaks volumes about what's happening within Boeing Commercial Airplanes.

Coming to a launch decision for an all-new airplane or derivative of an existing plane is never easy. Airplanes are manufactured and fly for decades. There's a lot on the line in each decision, not the least of which is the huge investment that can affect the company's future.

So today's design decisions have to be right, said Jeff VerWey, director of product strategy for Boeing Commercial Airplanes Business Development and Strategic Integration.

"It is a thorough process to bring the right airplane to market at the right time with the right technology and delivering the right economics," VerWey said.

Hundreds of studies and configurations provide vast amounts of data before a design concept is final, let alone before the launch plan is presented to the company's board of directors. And then it's years before the first new airplane or derivative rolls out of the factory, he noted.

Without disclosing sensitive information into that process, two development programs of the past—the 767 and 777—offer insight into the kind of design decisions evolving now that will shape Boeing's newest airplanes, according to VerWey.

The 767 was delivered to its first customer in 1982. It began as the 7X7 program, with memos dating back to 1971 describing an airplane with the 767's range and size. In all, more than



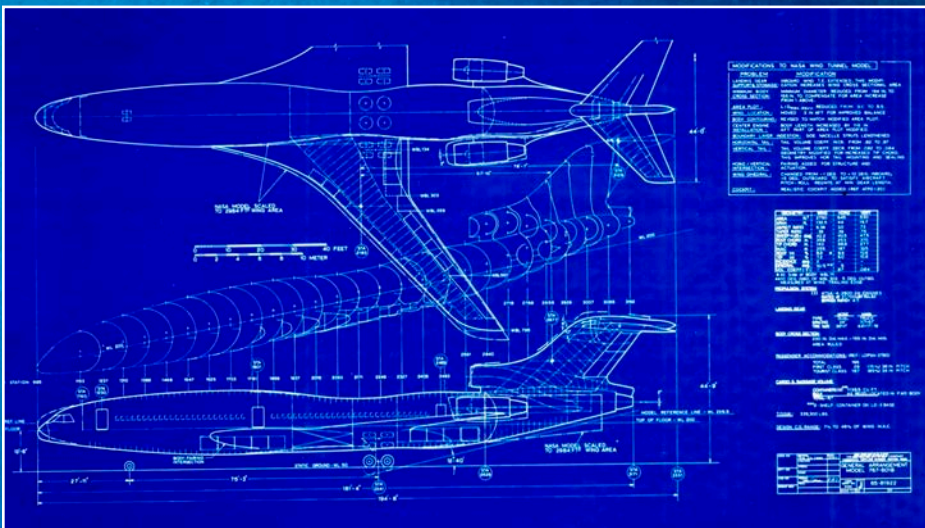
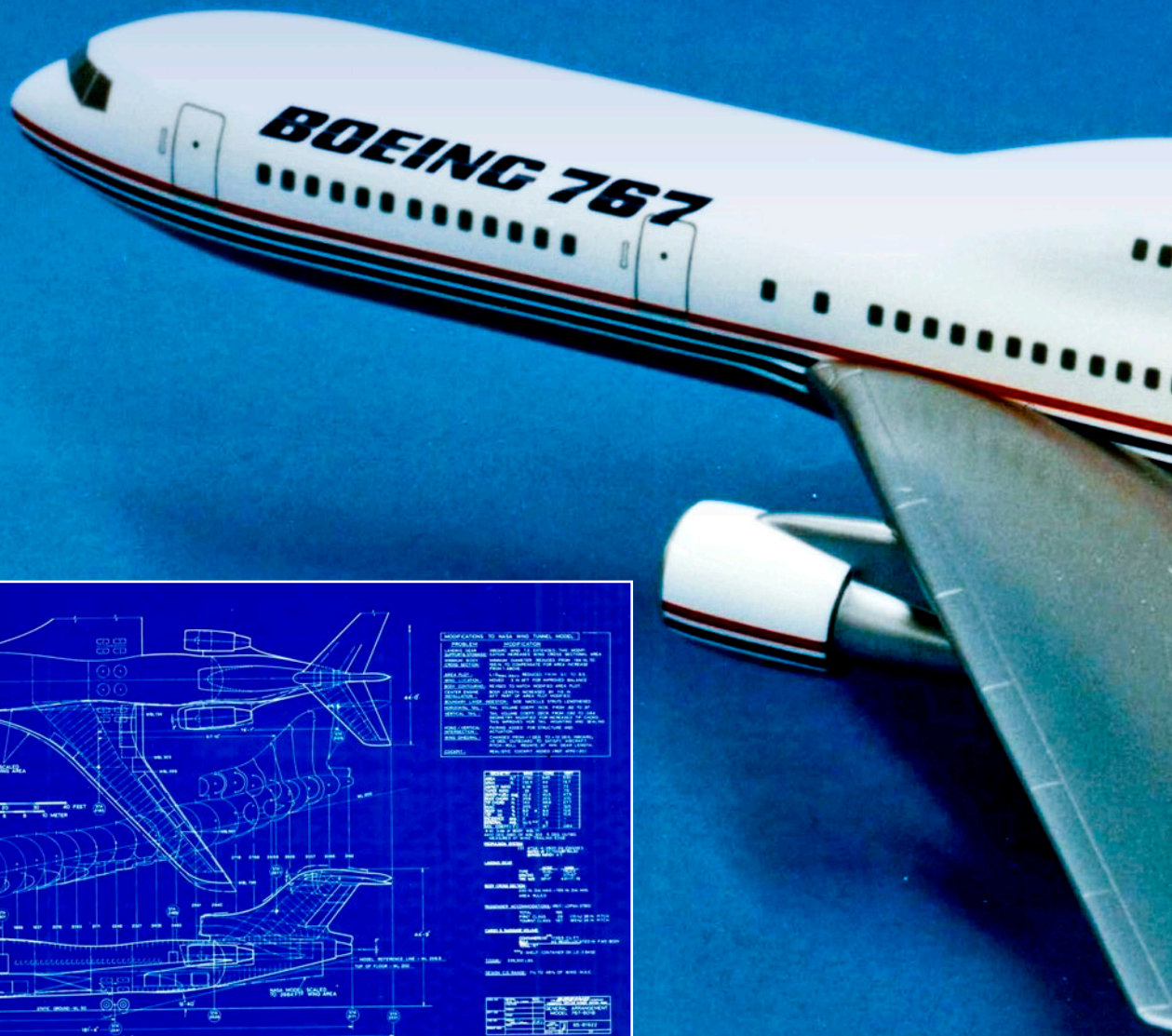
200 configurations of the 767 were studied before the program was launched in 1978.

A quick scan of models preceding launch of the two-engine 767 reveals numerous designs, including not only differing locations of the engines but even whether it should have four engines.

The final version of the 767 proved to be the most efficient jet in its class at the time. It was the first twin-aisle airplane to receive regulatory approval for flights more than 120 minutes from an airport, and it became the most popular airplane for crossing the Atlantic—a distinction it still holds nearly 30 years after it was introduced.

By the late 1980s, when airlines began looking for larger aircraft, Boeing teams deliberated on building a larger 767, dubbed the 767X. It included designs with an aft-section double deck, descriptively

PHOTOS: (Left) Models reflect the development process for Boeing jetliners. **(Above)** Boeing historian Mike Lombardi, left, discusses airplane models from Boeing development studies with Dennis Morden, center, holding a 767X model, and Rhodri Thomas. MARIAN LOCKHART/BOEING



“How we get there is an evolutionary process. That’s how this business works.”

– RHODRI THOMAS, WHO LEADS ADVANCED PROJECTS AND ANALYSIS FOR COMMERCIAL AIRPLANES’ PRODUCT STRATEGY TEAM

referred to as the “hunchback of Mukilteo,” a city adjacent to Boeing’s Everett factory. Eventually, designers turned instead to an all-new larger fuselage cross section that would eventually be named 777.

Other concepts examined included longer wings with folding wing tips.

The 767X design team continuously pushed its capabilities, delivering stretch models and ones with longer range, noted Dennis Morden, senior product strategy manager.

But it was not a straight line from idea to program launch, Morden explained. In his 43 years at Boeing, Morden has seen his share of concepts during the early design phases of the 767 and 777.

“It takes a lot of engineers and the finance team just to provide the level of

detail for the configurations you want to compare,” Morden said.

As with the 767, the 777 also evolved before, and after, its launch in 1990.

The world’s largest twinjet, the 777 first flew in 1994 and was certified and delivered to its first customer, United Airlines, in 1995. Boeing continued to focus on the 777 family and introduce derivatives with additional capability through 2006. The 777 reached the milestone of 1,000 airplanes delivered in just 17 years, less time than any twin-aisle airplane. In 2011, the long-haul market leader had a record year of more than 200 orders, and Boeing is increasing production to meet the demand.

During its final development, several 777 wing variations were studied. Some of those early wing studies, Morden said,



paired with today's latest developments in technology, are shaping current 777X efforts.

"It's a very iterative process," he said.

It starts with a basic concept and gets more complex with each level. Three key questions must be answered: What does the market want, will the technology exist to meet that need, and will the airplane be financially viable, VerWey said.

Trade studies, named for the trade-offs when making a change in airplane definition, can require hundreds of resources and take months, sometimes years, to complete. A tweak or change to a proposed configuration can impact range, performance, producibility and cost. And several configurations move through the design process at the same time to narrow the scope to the right idea, VerWey said.

"In the end, design will be driven by what customers tell us they need more than anything else," VerWey said.

After the 777, Boeing proposed what it called the Sonic Cruiser, a radically designed commercial airplane that would fly at nearly the speed of sound. But customers told Boeing they valued efficiency over speed. So the Boeing airplane that followed the 777 into the marketplace was the more conventionally shaped 787 Dreamliner.

Boeing continues to study the needs of the future markets, verifying designs and requirements of the new airplanes—all the while working closely with airlines.

"What we say we are going to deliver to the marketplace—a superior airplane that provides unmatched value to our customers—doesn't change," said

Rhodri Thomas, who leads advanced projects and analysis for Commercial Airplanes' product strategy team.

"How we get there is an evolutionary process. That's how this business works." ■

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PHOTOS: (Above) One design for the 767X was nicknamed the "hunchback of Mukilteo." **MARIAN LOCKHART/BOEING (Inset)** A blueprint of an early design of the 767.
BOEING ARCHIVES

CALL OF DUTY

Boeing veterans share their stories of military service

BY ERIC FETTERS-WALP AND PHOTOS BY BOB FERGUSON



Veterans make up more than 17 percent of Boeing's workforce, bringing unique experiences and specialized skills, along with pride, special attention to detail and discipline.

Boeing is part of Get Skills to Work, which is focused on training for U.S. veterans, helping translate military skills to advanced manufacturing jobs and assisting employers with recruiting, hiring and mentoring veterans. In less than two years, Boeing already has hired and trained nearly 3,000 veterans. Overall, approximately 24,500 self-identified veterans work at Boeing, with many continuing their service in the U.S. National Guard and Reserves.

Boeing has launched an affinity group for veterans, the Boeing Employees Veterans Association. Employees can learn more at <http://hr.web.boeing.com/index.aspx?com=59&id=1> on the Boeing intranet.



ROSA BARTOL

Rosa Bartol was a 17-year-old growing up in East Los Angeles, Calif., when she decided she wanted to see the world. Despite some wariness from her parents, she joined the U.S. Army.

"Right out of high school, one month later, I ventured into the world, just like I wanted to," said Bartol, who has traveled to all 50 of the United States, as well as Iraq and much of Europe. She now is on the cusp of retirement from the military after serving her nation for more than 25 years. During much of the same period, she has nurtured a career at Boeing.

"Boeing has always been really good about all my deployments and having a job for me when I came back," said Bartol, now in the Air National Guard and a Commercial Airplanes Security specialist at the Everett, Wash., site.

On her last deployment to Iraq, Bartol served as chief of living quarters for 57 women, helping take care of her fellow airmen while their forward operating base was frequently attacked.

"That was what I concentrated on—being the first sergeant to all those 20-year-olds, especially during the bad times."



ALEX COLE

Alex Cole, in his first job for Boeing as a manager for Air Force Systems in Arlington, Va., said he is happy to be working with a number of other veterans. "From our collective military experience you get people who like structure and can work with that," he said.

Seeing the SR-71 Blackbird and F-15 Eagles take off when he was a kid growing up on Kadena Air Force Base in Okinawa, Japan, Cole said, helped spark his ambition to become a pilot. His great-uncle was one of the famed Tuskegee Airmen and his father rose to the level of colonel in the Air Force before retiring.

Cole spent 20 years in the Air Force, during which he went to the U.S. Air Force Academy. He served long stretches in Japan and Saudi Arabia and flew RC-135 reconnaissance aircraft before applying to serve in the presidential airlift fleet, flying high-ranking administration officials under presidents George W. Bush and Barack Obama.



SCOTT MONTGOMERY

Scott Montgomery enlisted in the U.S. Navy in 1973, coming from a family steeped in naval service. During three years on aircraft carriers, he trained mechanics on how to maintain F-4 Phantom and F-14 Tomcat jet fighters before going to engineering school, interning at McDonnell Douglas and working for Hughes Space and Communications, both Boeing heritage companies. He now is an electrical engineering manager for Boeing Defense, Space & Security in Huntington Beach, Calif.

Being a veteran helps Montgomery interact with the military customer, he said, but that's not the most valuable thing he learned while he served.

"The biggest thing the Navy taught me is you might be in a situation where there's no one to ask, so you need to make a decision," he said. "You train yourself for success that way."



STEFANIE DAVIS

Stefanie Davis enlisted in the U.S. Navy straight out of high school in 1993, following in the footsteps of her grandfather, a World War II veteran, and her father, who served in Vietnam. Despite being valedictorian of her high school graduating class, she wasn't sure what she wanted to do after graduation. Getting out of her small town in Illinois seemed a good first step, she said. Davis ended up in Patrol Squadron 45 at Naval Air Station Jacksonville, Fla., where she worked in maintenance control for the squadron's P-3 anti-submarine aircraft. She got her wish of seeing the world during deployments to Iceland, Germany and Puerto Rico.

"The experiences were just fantastic. Working in maintenance control is what made me love airplanes," she said.

Davis, who served most of the 1990s on active and reserve duty, went to college to get a degree in aviation management, joined Boeing and eventually earned her master's degree in business administration. She now works for Boeing Defense, Space & Security in Contracts and Pricing for C-17 and F-15 aircraft.

"The similarities with the military are there," Davis said. "You work with a lot of different departments, trying to pull them all together and deliver a proposal."





ANTONIO WILLIAMS

Antonio Williams, who traveled to 44 different countries during his 20 years in the U.S. Navy, said military service cultivates attributes that he and other veterans bring to Boeing.

“We bring work experience, we bring discipline, we bring attention to detail and duty,” Williams said.

Williams served on seven different ships during his military career, completing four tours to Iraq. “Every day was a new adventure,” he said. “I went in as a baby and came out a man.”

Williams found out about Boeing’s job opportunities in the Navy’s transition classes at the end of his career in 2007 and “got a foot in the door” when he was hired at the Everett, Wash., site to be a factory service attendant—“a janitor,” Williams said frankly. Now, after more than four years of furthering his education and moving up, he’s a Functional Test manager for the 787 program. He said the transition from his naval career was smooth, thanks in part to Boeing’s training, educational programs and college assistance.

“If you want a structured environment like the one you served in, Boeing would be the best company for you to work with. It’s a great opportunity for veterans,” said Williams, who raises money for veterans and other causes as a motorcycle rider with the Stanwood (Wash.) American Legion Riders.





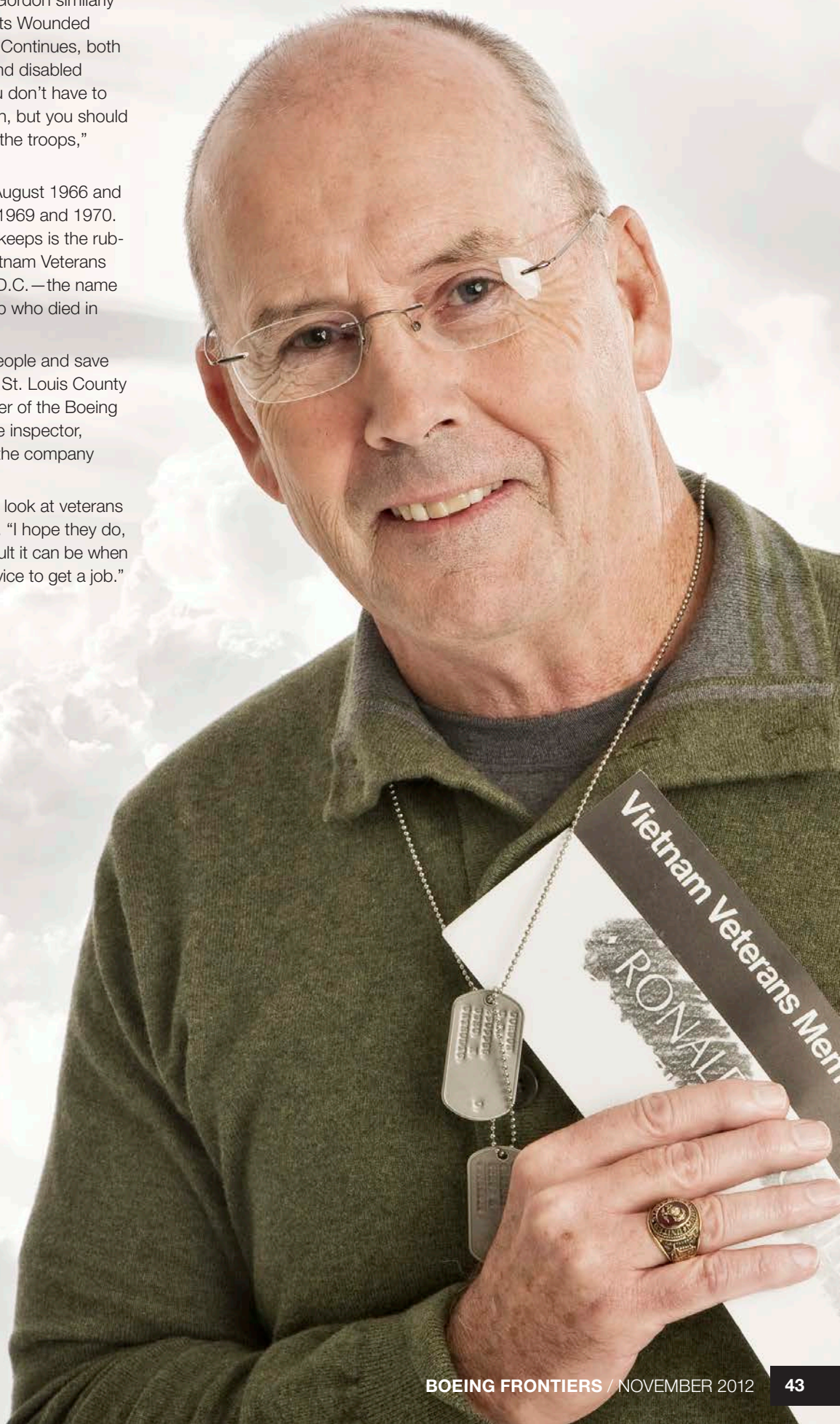
CARL GORDON

U.S. Marine veteran Carl Gordon similarly volunteers for and supports Wounded Warriors and The Mission Continues, both of which help wounded and disabled veterans. "I tell people you don't have to agree with what's going on, but you should support the veterans and the troops," Gordon said.

He joined the Marines in August 1966 and served in Vietnam during 1969 and 1970. One of the mementos he keeps is the rubbing of a name on the Vietnam Veterans Memorial in Washington, D.C. — the name of a friend from boot camp who died in that war.

Gordon's desire to help people and save lives led him to become a St. Louis County fireman and later a member of the Boeing fire department. Now a fire inspector, he marked 35 years with the company this summer.

"I think they give a special look at veterans when they apply," he said. "I hope they do, because I know how difficult it can be when you first get out of the service to get a job."



ONE AND THE SAME

LATAM is expanding its overseas service with Boeing jetliners

BY ELIZABETH BIERI

It's South America's biggest carrier, with a fleet of 311 aircraft and another 230 planes on order.

Known as the LATAM Airlines Group, it was created in June by the merger of Brazil's TAM and Chile's LAN airlines.

Having carried 60 million passengers in 2011 on routes to more than 150 destinations, the merged airlines are planning to expand their overseas footprint from their four major hubs in South America, linking North America, Europe and islands in the South Pacific.

Boeing's twin-aisle jetliners, including the 787 Dreamliner, will play an integral role in the plan to expand LATAM's overseas presence.

The merger of LAN and TAM is one of expansion, with the routes flown by the two airlines only overlapping by 3 percent. This allows LATAM to have an extensive presence in South America without much redundancy and inefficiency.

With the merger, LATAM Airlines Group has one of the highest market capitalizations in the airline industry.

Under the LAN brand, the new airline group received its first 787 Dreamliner in

August and has 31 on order. LAN was the first customer in both North and South America and the fourth customer in the world to receive the 787. The 787s will allow LATAM to open new markets and better serve others ahead of their competition.

In addition to the first Dreamliner, Boeing will have delivered to LATAM this year (in the seven-month period from June to December) 18 twin-aisle airplanes, a mix of 767, 787 and 777 passenger airplanes, as well as the 777 Freighter.

"It's an exciting time to be a LATAM customer," said Van Rex Gallard, Boeing vice president of sales for Latin America, Africa and Caribbean, Commercial Airplanes. "The addition of 777s and 787s to their fleet gives LATAM a lot of flexibility to grow their overseas presence in a sustainable way, while continuing to improve the passenger experience and staying on top of the competition."

In recent years, the Latin American economy has transformed into a market of stable growth and high potential. In 2011, the number of domestic air travelers in Brazil rose above the number of bus passengers for the first time, as 8.7 million

passengers took their first flight, according to Boeing's Commercial Market Outlook. LATAM aims to be part of this Latin American transformation, providing world-class customer service, the latest technology and, for many, a first flying experience, airline officials said.

The newly merged company is off to a good start. LATAM is the ninth-largest passenger airline in the world in terms of available seat kilometers, a common measurement of an airline's size, according to industry data. And second-quarter revenues across the group were up 19 percent over last year.

"Latin America is an emerging market with a lot of potential for growth," Gallard said. "LATAM's young, widebody fleet will be the bright start of this market." ■

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PHOTO ILLUSTRATION: A LAN 767, foreground, and TAM 777. Although recently merged, LAN and TAM will continue to operate as two separate airlines, keeping their individual LAN and TAM liveries. BRANDON LUONG/BOEING; AIRPLANE PHOTOS: ED TURNER/BOEING



PATH FINDER

A Delta IV rocket blasts off from Cape Canaveral Air Force Station, Fla., last month, carrying the third of a new generation of GPS satellites built by Boeing employees in El Segundo, Calif.

The satellites have more capabilities than the older GPS satellites and allow for more precise navigation for military and commercial uses worldwide. After launch, tests showed the GPS IIF satellite was functioning as expected.

PHOTO: UNITED LAUNCH ALLIANCE





A large white Space Launch System (SLS) rocket is shown ascending vertically against a clear blue sky. The rocket is surrounded by a massive plume of white smoke and fire at its base. To the right of the rocket, a tall, grey metal service structure is visible. The rocket features the NASA logo near the top, the words "UNITED STATES" vertically on the side, and a large "USA" logo on the lower section. The overall scene is one of powerful upward motion and technological achievement.

ENABLING EXPLORATION.

The Space Launch System (SLS) is the cornerstone of America's future in space, enabling a new age of discovery in deep space. In partnership with NASA, Boeing is leveraging its expertise and proven advanced technologies that are vital to ensuring SLS is safe, reliable and affordable. To learn more, visit www.beyondearth.com

