



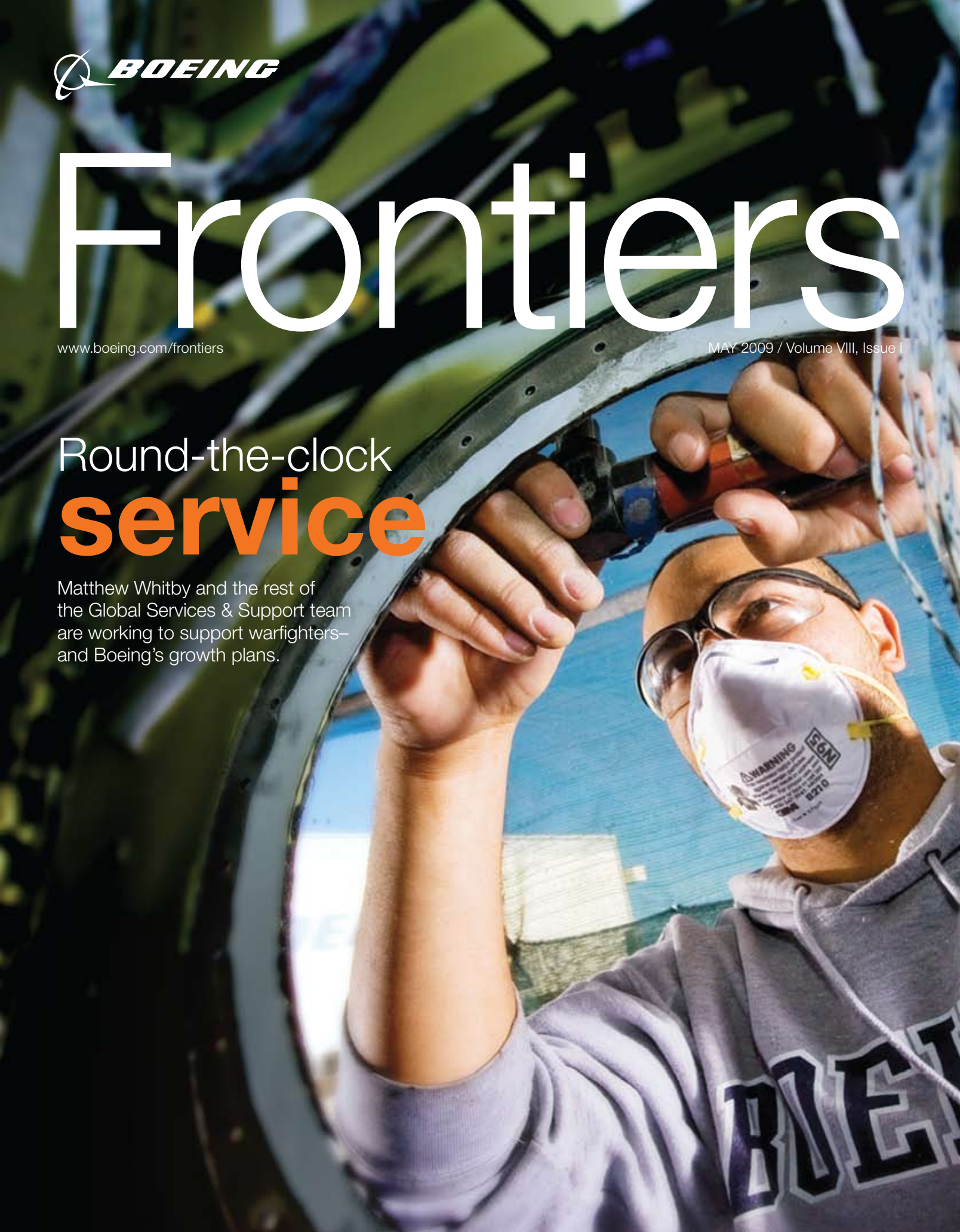
# Frontiers

[www.boeing.com/frontiers](http://www.boeing.com/frontiers)

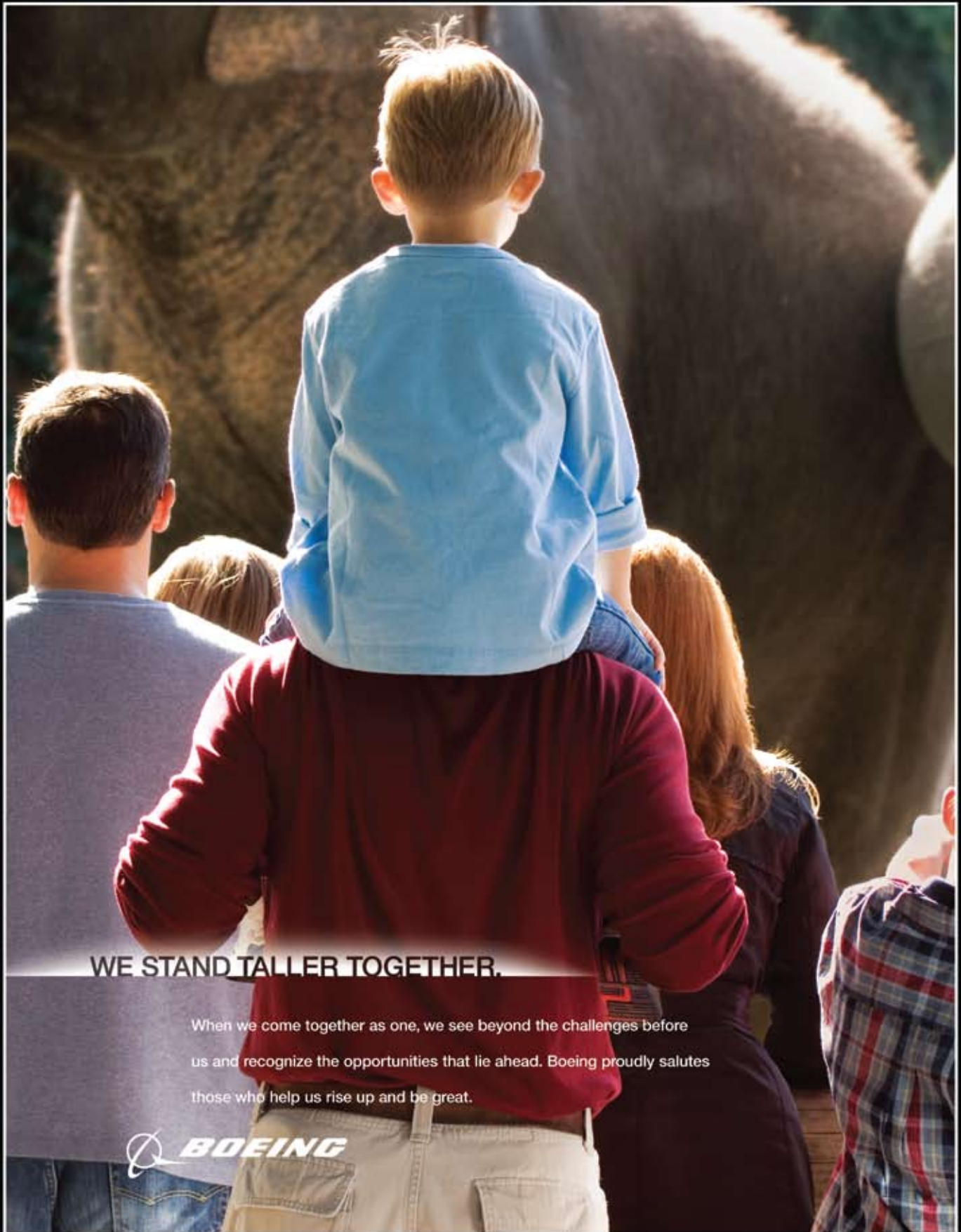
MAY 2009 / Volume VIII, Issue I

## Round-the-clock **service**

Matthew Whitby and the rest of the Global Services & Support team are working to support warfighters—and Boeing's growth plans.







**WE STAND TALLER TOGETHER.**

When we come together as one, we see beyond the challenges before us and recognize the opportunities that lie ahead. Boeing proudly salutes those who help us rise up and be great.



*Global corporate citizenship refers to the work Boeing does—both as a company and through its employees—to improve the world. This ad reinforces Boeing's commitment to those who bring people together to strengthen communities worldwide.*

## On the Cover

# 12

## Global Services & Support

Integrated Defense Systems' Global Services & Support division—with some 16,000 employees in more than 170 locations around the world—is poised to play a role in a services market valued at \$400 billion in the coming decade.

COVER IMAGE: MATTHEW WHITBY, INTEGRATED DEFENSE SYSTEMS IN SAN ANTONIO, ON A C-17 AIRCRAFT. LANCE CHEUNG/BOEING

PHOTO: JEAN OLSON, INTEGRATED DEFENSE SYSTEMS IN OKLAHOMA, WORKS ON A C-17 TRAINER. BOB FERGUSON/BOEING



## Main Feature

# 34 Own your career

Improving your on-the-job performance, increasing your value to the company and building a meaningful career are common goals for almost every Boeing employee, but everyone needs help attaining them. This series of articles is packed with helpful, informative resources and expert advice that will help you advance your personal development—and accelerate your career.





**20** North stars  
The many Boeing aircraft components fabricated in Winnipeg may be the most visible example of Boeing's presence in Canada, but it's just part of an extensive relationship between the company and Canada that spans 90 years.

**26** Moonshine wars  
Learn how Boeing employees embraced a Lean+ competition, modeled after a defunct cable television program, to brainstorm ideas and equipment that can improve safety, efficiency and productivity at work sites enterprisewide.

**32** Green gains  
Meet a "green team"—a group of Boeing employees who are boosting recycling to eliminate waste and generate savings for Boeing and its suppliers.

**48** Dispatches from Afghanistan  
Two Integrated Defense Systems communicators recently visited the United Kingdom Joint Helicopter Command in Afghanistan to report firsthand on the vital role Boeing products play in supporting coalition forces fighting the global war on terror.

**38**

When he was 14 years old, Will Station, Integrated Defense Systems, wrote down the milestones he wanted to achieve throughout his life. He still has that piece of paper and has reached every one. He and five other Boeing employees share the secrets of their success. **BOB FERGUSON/BOEING**

**INSIDE**

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# Between you and me: Candid conversations develop careers

*Julie-Ellen Acosta*  
Vice president, Leadership Talent Management

**T**hinking about how employees across the company can achieve their career goals is something that keeps me up at night. Each year, Boeing provides employees with the opportunity to develop skills through a combination of training and educational programs. These initiatives only represent part of the development process. The remainder relies on actual job experience, as well as managers, employees and co-workers providing ongoing feedback to one another.

Feedback that is constructive and timely is critical for future career growth. In order for feedback to occur, all team members need to contribute to a work environment that supports candid conversations. These open and honest discussions provide the opportunity to resolve sensitive issues, ask for help and develop skills.

Employees who are open to learning through every interaction will help sustain a culture that supports candid conversations. This includes proactively discussing any issue, as well as actively encouraging team feedback.

Candid conversations help all employees play an active role in shaping their careers. By performing an initial task well, and then identifying additional opportunities to support the business, the individuals profiled in this issue on pages 38–45 were able to accelerate their careers. The ability to connect our everyday work responsibilities with our overarching business goals cannot occur without discussions between team members that are open, honest and positive.

As a young engineer, I had visibility into high-level strategies through my exposure to the product life cycle—from an initial idea to walking through a finished airplane. Participating in this process helped me identify where I could add value and develop my career. Part of my success is the result of taking the initiative to actively seek feedback from peers and managers to make something happen. That's foundational in our business.

For many people, providing feedback is the most difficult—and the most painful—part of the job. No one wants to be hurtful, and there is a temptation to simply ignore issues and hope they go away. In the majority of instances when I did not proactively address an issue, the problem got bigger and harder to solve. By



BOB FERGUSON/BOEING

not supporting an environment that encourages feedback, employees hinder their personal development, as well as the growth of the company.

Employees who take the time to foster a work environment where candid conversations occur will help ensure they receive the feedback required to fuel future career growth. While sometimes difficult, these discussions will ultimately have a positive impact on all of us as we approach individual assignments and achieve our personal career goals.

Remember, feedback is no different from any other business process. You reap what you sow. Not getting enough feedback? If you pay attention, you'll find feedback all around you. From the hard numbers we deliver during quarterly earnings to the deadlines each of us has for the work we perform to Employee Survey results. And if you're still not getting enough feedback, all you have to do is ask. ■

# Frontiers

**Publisher:** Tom Downey  
**Editorial director:** Anne Toulouse

## EDITORIAL TEAM

**Editor:**  
 Paul Proctor: 312-544-2938  
**Managing editor (acting):**  
 Ann Beach: 312-544-2997

**Deputy managing editor:**  
 Vineta Plume: 312-544-2954

**Art director:**  
 Brandon Luong: 312-544-2118

**Commercial Airplanes editor:**  
 Julie O'Donnell: 206-766-1329

**Engineering, Operations & Technology editor:**  
 Junu Kim: 312-544-2939

**Human Resources and Administration editor:**  
 Geoff Potter: 312-544-2946

**Integrated Defense Systems editor:**  
 Diane Stratman: 562-797-1443

**Shared Services editor:**  
 Beriah Osorio: 425-577-4157

## ONLINE PRODUCTION

**Production manager:**  
 Alma Dayawon: 312-544-2936

**Web designer:**  
 Michael Craddock: 312-544-2931

**Graphic designer:**  
 Brandon Luong: 312-544-2118

**Web developers:**  
 Lynn Hesby: 312-544-2934  
 Keith Ward: 312-544-2935

**Information technology consultant:**  
 Tina Skelley: 312-544-2323

## HOW TO CONTACT US:

**E-mail:**  
 BoeingFrontiers@boeing.com

**Mailing address:**  
 Boeing Frontiers  
 MC: 5003-0983  
 100 N. Riverside Plaza  
 Chicago, IL 60606

**Phone:**  
 312-544-2954

**Fax:**  
 312-544-2078

**Web address:**  
 www.boeing.com/frontiers  
 Send all retiree address changes to  
 Boeing Frontiers, MC 3T-12  
 P.O. Box 3707  
 Seattle, WA 98124-2207

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 Boeing Frontiers, MC 3T-12  
 P.O. Box 3707, Seattle, WA 98124-2207  
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**May 6–7:** Airline Purchasing Expo 2009. London. See [www.aviationindustrygroup.com](http://www.aviationindustrygroup.com)

**May 6–7:** *Aviation Week* Bird Strike Prevention Forum. Chicago. See [www.aviationweek.com/events/current/bird](http://www.aviationweek.com/events/current/bird)

**June 15–21:** Paris Air Show. Paris. See [www.paris-air-show.com](http://www.paris-air-show.com)

**July 2–5:** Expo Aero Brasil International Aeronautical & Defense Fair. São José dos Campos. See [www.eventseye.com/fairs/f-expo-aero-brasil-13321-1.html](http://www.eventseye.com/fairs/f-expo-aero-brasil-13321-1.html)

**July 20–23:** 19th Annual Symposium of the International Council on Systems Engineering. Singapore. See [www.incose.org/symp2009](http://www.incose.org/symp2009)

**Aug. 13–16:** Taipei Aerospace & Defense Technology Exhibition. Taipei. See [www.eventseye.com/fairs/f-tadte-taipei-aerospace-defense-technology-exhibition-2637-1.html](http://www.eventseye.com/fairs/f-tadte-taipei-aerospace-defense-technology-exhibition-2637-1.html)

**Sept. 13–15:** 15th World Route Development Forum. Beijing. See [www.routesonline.com](http://www.routesonline.com)

**Sept. 14–16:** *SpeedNews* 10th Annual Aviation Industry Suppliers Conference. Toulouse, France. See [www.speednews.com/ConferenceInfo.aspx?conferenceID=3](http://www.speednews.com/ConferenceInfo.aspx?conferenceID=3)

**Sept. 14–17:** American Institute of Aeronautics and Astronautics' Space 2009 Conference and Exhibition. Pasadena, Calif. See [www.aiaa.org/content.cfm?pageid=230&lumeetingid=2074](http://www.aiaa.org/content.cfm?pageid=230&lumeetingid=2074)

**Sept. 15–17:** Cargo Facts 2009. Seattle. See [www.cargofacts.com](http://www.cargofacts.com)

**Sept. 22–24:** *Aviation Week* MRO Europe 2009. Hamburg. See [www.aviationweek.com/events/current/meu](http://www.aviationweek.com/events/current/meu)

**Oct. 20–22:** National Business Aviation Association 62nd Annual Meeting & Convention. Atlanta. See [www.nbaa.org](http://www.nbaa.org)

**Oct. 20–25:** Seoul International Aerospace & Defense Exhibition 2009. Seoul. See [www.seoulairshow.com](http://www.seoulairshow.com)

**Nov. 2–4:** *Aviation Week* Aerospace & Defense Programs. Phoenix. See [www.aviationweek.com/events/current/ad](http://www.aviationweek.com/events/current/ad)

**Nov. 15–19:** Dubai Airshow 2009. Dubai, United Arab Emirates. See <http://dubaiirshow.aero>

**Dec. 2–3:** *Aviation Week* Aerospace & Defense Finance Conference. New York. See [www.aviationweek.com/events/current/fin](http://www.aviationweek.com/events/current/fin)

**Dec. 8–10:** *Aviation Week* MRO Asia 2009. Hong Kong. See [www.aviationweek.com/events/current/mas](http://www.aviationweek.com/events/current/mas)

## Corrections:

In "The engagement factor" (April 2009, Page 41), the name of a consulting company was misstated. The name should be Sirota Consulting.

## CALENDAR GUIDELINES

*Boeing Frontiers* assembles the above listings for the convenience of its readers only, and they do not constitute an endorsement by The Boeing Company. Times, dates and subject matter are subject to change or cancellation. If

you have any items you wish *Frontiers* to consider for the Calendar, please e-mail them to [boeingfrontiers@boeing.com](mailto:boeingfrontiers@boeing.com), or send them by mail to *Boeing Frontiers* magazine, 100 N. Riverside, MC: 5003-0983, Chicago, IL 60606-1596.



# Snapshot

## Full steam ahead

A Boeing F/A-18F Super Hornet launches from a steam-powered catapult on the aircraft carrier USS *Ronald Reagan* during exercises over the Pacific Ocean. The steam is from the adjacent catapult, which fired just before this aircraft launched. The swirls are formed by the right wingtip vortex generated by the aircraft as it launches and interacts with the steam. U.S. NAVY



## Quotables

“We’re just now beginning to see the full potential’ of the research.”

– Joy Bryant, Boeing vice president and program manager, International Space Station, speaking to reporters at an industry conference about the scope of scientific research that can be performed on a completed ISS, as reported in the April 11 Wall Street Journal

“We know that the future will see an increase in unmanned systems of all kinds—with further reach and more capabilities.”

– U.S. Defense Secretary Robert Gates, discussing his budget proposal for 2010 with military officers at the Air War College at Maxwell Air Force Base, Montgomery, Ala., as reported in the April 16 Defense Daily newsletter

## IAM PROMOTIONS

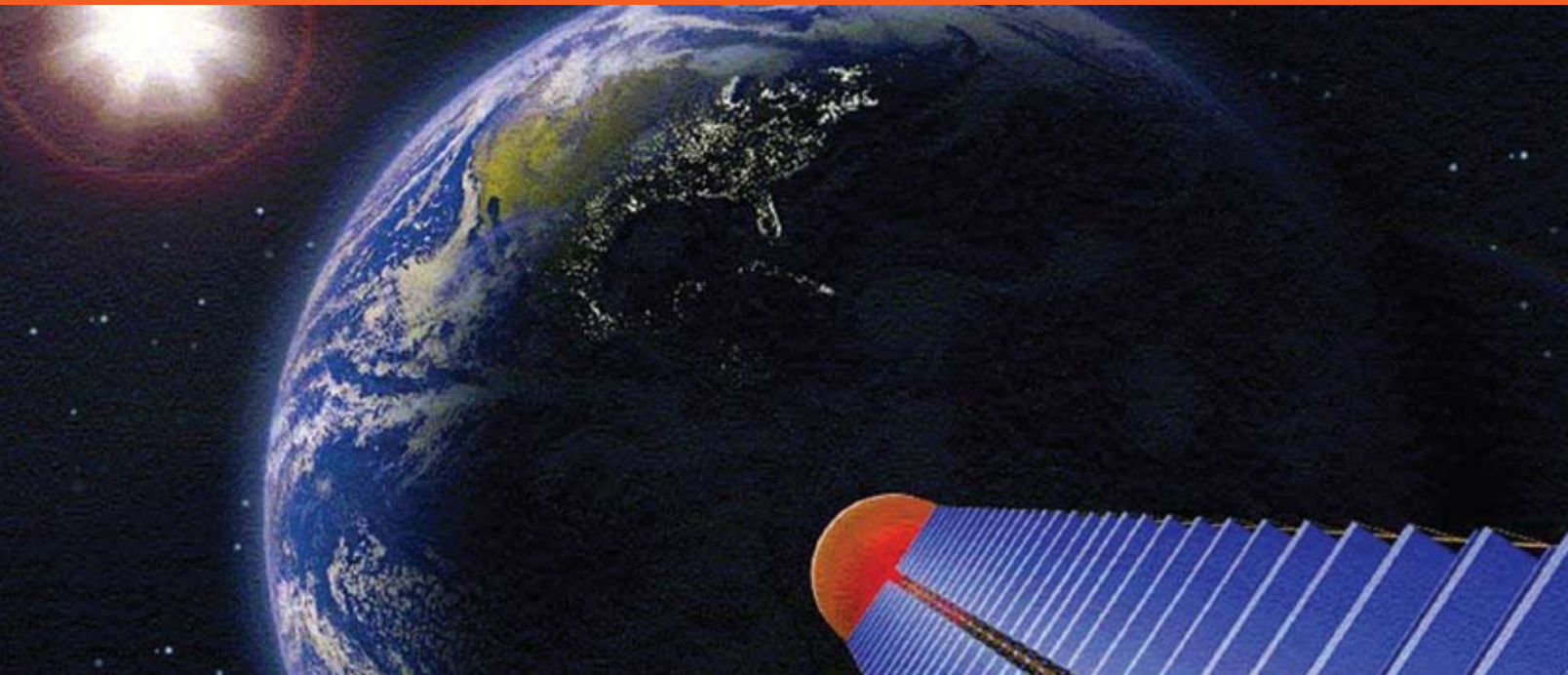
No promotions listed for periods ending March 27 and April 3, 10 and 17.

## ETHICS QUESTIONS?

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# Harnessing the sun

The decades-long quest to power Earth from solar power satellites in space



By Eve Dumovich

Imagine a series of satellites, each the size of a small city, which together produce and beam down enough electricity to power a whole country. Boeing scientists designed such a system almost 30 years ago and, though it never went into production, Boeing today remains at the forefront of exploring solar power.

Those early Boeing efforts began after the oil embargo of 1973 made it clear that alternative energy sources would be needed. Boeing Advanced Space programs began work on highly innovative solar power satellites capable of transforming the sun's energy into electricity on Earth. Boeing engineers already had proved their experience with launch systems during the Apollo program moon landings, and in placing hardware in orbit which used solar energy for power.

At the time, Boeing and the aerospace business of Rockwell International, now part of Boeing, competed for a contract from

**GRAPHIC:** In this artist's rendition of a proposed Boeing Sun Tower satellite, many solar panels would collect and beam down solar energy to Earth. **BOEING**

the U.S. Department of Energy and NASA's Satellite Power System Concept Development and Evaluation Program. Rockwell won a study contract issued by Marshall Space Flight Center in Huntsville, Ala., and Boeing won a contract with Johnson Space Center in Houston.

The Boeing study proposed satellites, "each giving an output of 5,000 megawatts of electricity—the equivalent of five nuclear power plants. These huge satellites, covered with 20 square miles of solar cells, would be placed in geosynchronous orbit—22,300 miles above the equator," said Ralph Nansen, a former Boeing engineer and manager of Advanced Space Programs who worked on solar power satellites during the 1980s.



“Boeing is currently combining these capabilities into a network-centric power system for near-term space solar power demonstrators.”

– Dean Davis, Boeing Phantom Works Analysis, Modeling, Simulation & Experimentation

The proposal called for Boeing solar power satellites to be constructed either in low-Earth orbit for later transfer to higher geosynchronous orbit, or constructed directly at the higher orbit. Large space freighters, known as heavy-lift launch vehicles, would carry outsized cargo pallets into low-Earth orbit where they would be deposited at a space construction base. A modified Space Shuttle Orbiter would carry the personnel needed to the orbiting construction site.

“Everything was falling into place,” Nansen said. “Applications poured into the company from engineers and scientists who wanted to work on solar power satellites.”

Early studies indicated that the revenue from one solar power satellite, producing and beaming down to earth 10,000 megawatts of electricity sold then at a rate of 4 cents per kilowatt hour, would produce \$105 billion in 30 years, according to Boeing reports.

In 1995, NASA began a “Fresh Look” study of space solar power techniques and concepts. In 1998, Congress authorized modest funding for further concept definition and technology development.

Boeing studies included not only a constellation of satellites but also solar power satellite technology applications in a laser-powered lunar rover and solar-powered propellant production depots in low-Earth orbit and on the moon that would use solar power to convert water into cryogenic propellants for moon and Mars exploration.

Fast-forwarding to present day, Boeing continues to lead in solar power research and technology. In November 2008, Boeing’s wholly owned subsidiary, Spectrolab Inc., in Sylmar, Calif., received the 2008 SpotBeam Award for Space Innovation from the California Space Authority in recognition of its 50 years of advancements in photovoltaic solar cell technology, solar panels and related products. Spectrolab has long been the world’s leading supplier of solar panels for communication satellites. Continuing advances in solar cell efficiency (now demonstrated at more than 40 percent under concentrated solar radiation), along with many other advances in space technology, have made the prospects for an economical space solar power system better than ever.



**PHOTO:** German Rivera, wafer processing technician at Spectrolab in Sylmar, Calif., inspects a semiconductor wafer that will yield numerous solar cells used to generate power for telecommunications satellites and spacecraft such as the Spirit and Opportunity rovers currently exploring Mars. BOB FERGUSON/BOEING

Recently, the U.S. Defense Advanced Research Projects Agency selected Boeing to conduct the second phase of the Fast Access Spacecraft Testbed program, a multiphase effort to design and develop a ground-test prototype of a new high-power-generation, ultra-lightweight spacecraft solar array. Boeing is also developing both radio frequency and laser power transmission and reception technologies, which will allow space- and Earth-based users to request and receive satellite-generated power on demand.

“Boeing is currently combining these capabilities into a network-centric power system for near-term space solar power demonstrators,” Dean Davis said. He’s senior principal aerospace scientist/engineer and Space Solar Power study leader with the Boeing Phantom Works Analysis, Modeling, Simulation & Experimentation team in El Segundo, Calif.

Davis added, “We hope these projects will lead to full-scale power satellites that, when combined with terrestrial solar, hydroelectric, geothermal and wind-power sources, will be able to provide independence from fossil-fuel energy within the next 50 years.” ■

*eve.m.dumovich@boeing.com*

# ScanEagle

## supports rescue of freighter captain held by pirates

The U.S. Navy last month released photos of the 28-foot lifeboat in which U.S. freighter captain Richard Phillips was held hostage by four Somali pirates. The images were taken by a ScanEagle unmanned aircraft system (UAS), a joint effort of Boeing and its subsidiary, Insitu Inc., launched from the U.S. Navy destroyer USS *Bainbridge*.

News reports indicated that four raiders boarded the 17,000-ton (15,422-metric-ton) *Maersk Alabama* freighter on April 8. A struggle ensued, and the crew retook control of the vessel, capturing one of the pirates and a machine gun. The other three pirates took the captain hostage and fled in the freighter's lifeboat, retrieving their colleague in an aborted hostage exchange. U.S. Navy SEAL sharpshooters ended the incident April 12, killing three pirates. The fourth pirate is in custody. Phillips was returned to safety aboard the *Bainbridge*.

Boeing Global Services & Support Intelligence, Surveillance and Reconnaissance (ISR) Services team members operating the ScanEagle UAS aboard the *Bainbridge* detected the lifeboat in the Indian Ocean and used the system to track its activities, receiving electro-optical and infrared still and video feeds from ScanEagle's sensors.

Navy Vice Adm. Bill Gortney, commander of U.S. Naval Forces Central Command, commended those involved in the rescue: "This was an incredible team effort, and I am extremely proud of the tireless efforts of all the men and women who made this rescue possible," Gortney said in a U.S. Navy release.

This is the second incident in which video feeds from ScanEagle have assisted the U.S. Navy in their efforts to keep the sea lanes off Somalia clear of pirates. In February, an ISR Services team aboard the destroyer USS *Mahan* provided video used by the Navy to capture nine pirates.

"ISR Services has teams deployed in Iraq and Afghanistan as well as on Navy ships in key locations around the world," said Phil Panagos, director, ISR Services. "These teams use ScanEagle to provide video to the customer."

The long-endurance, fully autonomous ScanEagle UAS carries inertially stabilized electro-optical and infrared cameras that allow the operator to track both stationary and moving targets. Capable of flying above 16,000 feet (4,877 meters) and loitering over the battlefield for more than 24 hours, the 4-foot-long



**PHOTO:** Nearly invisible and inaudible at its usual operating altitude of 1,500 feet (457 meters), the Boeing-Insitu ScanEagle unmanned aircraft system, shown here following a recovery aboard the destroyer USS *Oscar Austin*, operates from several different types of U.S. Navy vessels. A ScanEagle operated from the *Oscar Austin's* sister ship, USS *Bainbridge*, provided critical intelligence, surveillance and reconnaissance support during the tracking of Somali pirates and subsequent rescue of U.S. freighter captain Richard Phillips in April. U.S. NAVY

(1.2-meter) platform provides persistent low-altitude intelligence, surveillance and reconnaissance. Nearly invisible and inaudible at its usual operating altitude of 1,500 feet (457 meters), ScanEagle has protected lives and provided enhanced battlespace awareness in Iraq and Afghanistan since 2004.

ScanEagle is launched autonomously from a pneumatic SuperWedge catapult launcher and flies either preprogrammed or operator-initiated missions. The Insitu-patented SkyHook system is used to retrieve the UAS, capturing it by way of a rope suspended from a 50-foot-high (15-meter-high) mast. The system makes ScanEagle runway-independent and minimizes its impact on shipboard operations, similar to a vertical-takeoff-and-landing vehicle. ■





## Air of **distinction**

Boeing delivered its 6,000th 737 last month. Norwegian Air Shuttle is operating the record-breaking airplane, on lease from International Lease Finance Corp. The delivery total includes first models (737-100s and -200s), classics (-300s, -400s and -500s) and Next-Generations (-600s, -700s, -800s and -900s). Unfilled orders for Next-Generation 737s exceed 2,200 airplanes valued at approximately \$163 billion at list prices.

JIM COLEY/BOEING



## American Airlines welcomes **new Boeing 737-800s**

American Airlines welcomed two new Boeing 737-800 aircraft into its fleet last month. The new airplanes, which went into service April 14, are the first of 76 737-800s that will be added to American's current fleet of 77 737-800s, replacing aircraft in American's fleet of approximately 270 MD-80s.

Offering many cost and environmental benefits, the new airplanes also feature a configuration aimed at improving the passenger experience and operational efficiency. Upgrades include new overhead "big bins" that will significantly increase passenger cabin luggage storage capacity by allowing roll-on bags to be loaded wheels first.

"Boeing is pleased to be a part of this new chapter in American Airlines history," said Kevin Schemm, vice president, North America Sales, Commercial Airplanes. "We look forward to seeing these state-of-the-art airplanes in the skies."

BYRON TOTTY/AMERICAN AIRLINES



## Lucky 7s

Boeing and longtime partner Air France celebrated milestones last month with the delivery of the 777th 777. The airplane, a 777-300ER (Extended Range), also is the first to wear the new Air France livery and company brand identity. Air France currently is one of the largest operators of these jets in the world, with 54 777s in its fleet.

GAIL HANUSA/BOEING

# A world of opportunity

IDS' Global Services & Support entity has a new name, a new division and sky-high potential. Now comes the job of executing on its core business and its growth plans.





“Boeing is recognized as the industry leader as far as supporting legacy platforms goes. It is the only company that has a truly complete, across-the-board sustainment capability.”

– Tony Robertson, GS&S vice president, Maintenance, Modifications and Upgrades

By Liz Lane

In the wee hours of the morning, most people in the area around Altus Air Force Base, Okla., are asleep. But not Jean Olson.

She's a C-17 aircrew training device technician for Boeing at Altus, where she spends her nights working hard to ensure the C-17 aircrew trainers are ready for pilots when they arrive in the morning.

It's not easy work. To maintain the highly complex simulator, each night Olson tackles an extensive preventive maintenance checklist in addition to troubleshooting problems identified during the day by the instructors and pilots during training sessions.

“Making sure that pilots have the most reliable and realistic training available to help ensure their safety and success is a service I am proud to provide for our warfighters, amid the ongoing war on terror,” Olson said.

Olson is part of the Global Services & Support team at Boeing. GS&S, one of the businesses of Integrated Defense Systems, is made up of more than 16,000 people in more than 170 locations worldwide. These employees are dedicated to delivering affordable support and sustainment of Boeing military airplanes and provide numerous services, such as training and simulation for military systems. Collectively, they bring different skills to the table, but they share a simple, common goal: Ensure that customers can successfully execute their missions.

With a strong future need envisioned for GS&S' capabilities, Boeing sees this business as a major driver of growth, especially as GS&S moves into new markets. But turning this market potential into reality requires all GS&S employees being engaged in helping the organization achieve its goals, according to IDS leaders.

“Boeing's ability to support our customers' post-production needs is key to IDS' business health for the future,” said Jim Albaugh, IDS president and CEO. “Global Services & Support's successful move into new markets, as well as its

continued execution on key maintenance, upgrade and training programs, is critical to Boeing's growth. It is one of the real growth engines that we are looking to in IDS as we work to continue leading the defense industry in providing support and readiness to warfighters around the globe.”

Added GS&S President Dennis Muilenburg: “[GS&S] is a service business: We are successful because of what people do.”

## RESHAPING THE BUSINESS

In September 2008, IDS renamed the business formerly known as Support Systems to Global Services & Support—a name that better communicated the organization's global potential. Accompanying that announcement was the launch of Defense & Government Services. This new GS&S division now is applying Boeing's large-scale integration expertise to deliver service solutions for infrastructure support, aviation and logistics, information, support operations, and managed communications, among other areas, in a market valued at \$400 billion in the coming decade (see box on Page 15).

The move takes the company into new territory: an attractive,



**PHOTOS: (LEFT)** Jean Olson works on a C-17 aircrew trainer at Altus Air Force Base, Okla. **BOB FERGUSON/BOEING**

# “Boeing’s ability to support our customers’ post-production needs is key to IDS’ business health for the future.”

– Jim Albaugh, Integrated Defense Systems president and CEO

cost-driven marketplace filled with able mid-sized competitors. Succeeding in this field will require working to identify methods to minimize cost. Additionally, this arena, which rewards rapid responders, requires tremendous flexibility as well as tightrope agility.

“This marketplace requires support in a fraction of the time allowed in the traditional aerospace market,” Muilenburg said. “Because GS&S serves the end user directly, many requests need immediate response. Cost competitiveness is essential as well: A low-cost structure is key to winning business. Everyone must drive productivity and efficiency.”

Along with these changes comes a challenge to double the business in five years. That’s a tall order—but Muilenburg is confident GS&S can reach this target by expanding its core business, moving into adjacent markets and delivering new, innovative services.

“Our mission is to be the premier provider of defense and government services and support worldwide. We’re well on our way,” he said. “By focusing on employees and customers, we can deliver exceptional services on demand to assure the customer readiness needed in today’s marketplace.”

Fulfilling these growth plans requires flawless execution on core businesses, which includes: supporting such aircraft as the KC-135 Stratotanker, B-52 Stratofortress, KC-10 Extender, A-10 Thunderbolt, C-130 Hercules, F/A-18E/F Super Hornet, C-17 Globemaster, AH-64 Apache, CH-47 Chinook and other Boeing military airplanes; training and simulation for military systems; and other services.

Yet that’s only part of what GS&S needs to do to meet its goals. GS&S is following

*(Continued on Page 16)*





# Introducing

## Defense & Government Services



Global Services & Support's newest division, Defense & Government Services, was created last September to better serve customers in the expansive services market.

This organization, which includes the subsidiaries Boeing Service Company and Boeing Aerospace Operations, features four groups under the direction of an integrated management team. That setup helps create a low-cost rate structure by enabling development of a tailored suite of tools and processes. It also gives Boeing a capability-based organization that can tap expertise from around the company—which, in the end, reduces the overall price to market.

**PHOTO: (LEFT)** Matthew Whitby, a structural mechanic at Boeing's San Antonio site, works on the pressure box cutout for the Small Laser Transmitter Assembly on a C-17 aircraft. The work is part of the installation process for the Large Aircraft Infrared Counter Measures modification. **LANCE CHEUNG/BOEING**

**PHOTO: (TOP)** Employees monitor a simulated exercise at the Boeing Virtual Warfare Center in St. Louis. This simulation capability is among the services offered by the new Defense & Government Services unit of Global Services & Support.

**RICHARD RAU/BOEING**

"Essentially, we are redefining effective and efficient service delivery," said Greg Deiter, vice president of D&GS. "It is all about working together and smarter across the enterprise. We deliver value by helping our partners harness resources to drive business efficiencies, and we're starting in our own backyard."

— Liz Lane

“It’s imperative we continue to look for innovative ways to position ourselves in this challenging global economy. As the world changes, our strategies must be agile enough to react, to help us maintain our market strengths.”

– Torbjorn Sjogren, GS&S vice president, International Support Systems



a growth strategy that requires rethinking of business models—and emphasizes four approaches to serve the market and fuel expansion: delivering performance-enhancing innovations, leveraging expertise to support non-Boeing platforms, expanding international capabilities and serving new markets.

### IDEAS, INNOVATION, IMPROVEMENT

It’s easy to envision how maintenance work on an aircraft helps support customers’ abilities to execute missions. Yet GS&S is offering innovative ways to improve its customers’ performance.

Consider Boeing’s C-17 Globemaster III Sustainment Partnership contract, the world’s first performance-based logistics (PBL) program. To ensure that aircraft are ready when needed, a PBL provides incentives to hit established metrics such as platform readiness.

Boeing is working to increase PBL performance in a

**PHOTO:** Alsalam Aircraft Company employees provide support to the Royal Saudi Air Force F-15S fleet. Boeing’s partnership with Alsalam reflects Boeing’s interest in expanding its international service capabilities. ALSALAM AIRCRAFT COMPANY

surprising place—the contracting office. Contracting specialists have teamed with modeling and simulation experts to analyze many factors. Through exhaustive analyses and experimentation, they have introduced new contract terms, conditions and pricing models to achieve program objectives while balancing risks and rewards for all parties.

“When you weave an innovative contracting structure together with our strong supply-chain capabilities, accurate forecasting and logistics expertise, you get a powerful tool to exceed customer requirements,” said Jim O’Neill, Integrated Logistics vice president and general manager. “This ability, coupled with

*(Continued on Page 18)*





# People first

Boeing's talented, dedicated employees are its heart and soul. Recognizing this, Global Services & Support embraces a "People First" mind-set by focusing on and partnering with employees to engage them in the strategic plan and develop leaders for the future.

"Our people generate the ideas to grow our business. And, invariably, where employees have taken ownership of their work environments, they increased efficiencies and helped us become more competitive," said GS&S President Dennis Mulenbourg.

Here are a few GS&S teams that have done this.

**West Coast Missileers and Frozen Chosen teams:** These Employee Involvement teams—the West Coast Missileers and the Frozen Chosen—help support the Ground-based Midcourse Defense system, the core of the Missile Defense Agency's ballistic missile defense program. Using Lean+ methodologies, these teams reduced the cycle time to process a missile interceptor by more than 55 percent and saved the program more than \$6 million, with another \$5 million in queue.

**Proposal Acquisition Cell team:** The Proposal Acquisition Cell team applied bar-code technology to the procurement process. By scanning Apache helicopter spare part orders, team members simplified tracking, cut order backlog by nearly 83 percent and reduced order process time by nearly 74 percent. Thanks to this new system, the group projects annual cost savings of about \$500,000. Other sites are adopting this system.

**KC-135 Programmed Depot Maintenance team:** The Breakers, a KC-135 Programmed Depot Maintenance team, developed aircraft tooling that is resistant to flexing and provides a more positive fitting location. The easier-to-install tooling has reduced the number of hours on task from 22.4 to 12.8 per aircraft, delivering an estimated annual savings of more than \$93,800.

**E/A-18G Aircrew Trainer System team:** The E/A-18G Aircrew Trainer System team developed a larger share of the software application in-house on a dedicated development device. By using economical processes and meeting an accelerated schedule to deliver the training simulator at the same time the first E/A-18G was delivered to the U.S. Navy, team members provided significant cost savings.

— Liz Lane

**PHOTO:** Michael Gutierrez, a flight operations general mechanic, performs a post-flight brake inspection on a KC-135 aircraft at Boeing's San Antonio site. The site is home to Boeing's KC-135 Programmed Depot Maintenance program, which has made numerous process improvements. LANCE CHEUNG/BOEING





efficient program execution, continual cost reductions and performance enhancements, provides real value.”

Managing supply chains is the root of another GS&S innovation for improved customer performance. A military strategy may be genius, but without logistics it’s all for naught. So Boeing last year announced it was acquiring two leading software firms, Tapestry Solutions and Federated Software Group. These companies offer logistics command and control (LogC2) tools that are de facto standards used by the customer to track equipment, parts and personnel, and integrate information to help with logistics decision-making. The addition of these two companies lets Boeing develop new integrated applications and solutions.

The real value of LogC2 comes from increased supply-chain efficiency. Tapestry’s Battle Command Sustainment Support System tracks military assets with in-transit visibility from point of origin through delivery. By analyzing and tracking logistics at this level, GS&S can optimize supply-chain performance from

factory to foxhole. The result: more items moving through a distribution system at the lowest possible cost across all modes of transportation.

### **BEYOND BOEING PLATFORMS**

Interestingly, GS&S’ growth plans include using the extensive expertise of its people to support non-Boeing platforms.

GS&S has received three contracts, with a fourth under consideration, to modify the A-10 Thunderbolt, a Fairchild-Republic-built aircraft. GS&S’ Maintenance, Modifications and Upgrades division tapped into the best of Boeing to optimize performance and minimize expenses, beginning with upfront cost savings of \$200 million. A key factor in winning those contracts was MMU’s progressive tooling and advanced assembly techniques.

“Boeing is recognized as the industry leader as far as supporting legacy platforms goes,” noted Tony Robertson, MMU vice president. “It is the only company that has a truly complete,



“When you weave an innovative contracting structure together with our strong supply-chain capabilities, accurate forecasting and logistics expertise, you get a powerful tool to exceed customer requirements.”

– Jim O’Neill, *Integrated Logistics vice president and general manager*

**PHOTO:** A-10 Wing Replacement Program team members Terry Saville (left) and Derek Bennett survey an existing A-10 wing. More than 200 new wing sets will be delivered to the U.S. Air Force under the contract. RON BOOKOUT/BOEING

across-the-board sustainment capability.”

The largest A-10 contract, the Wing Replacement Program, calls for engineering and manufacturing more than 200 wing sets. With more than 50 suppliers and 10,000 parts, WRP requires unerring program management. In a textbook example of performance excellence, program leaders engaged the team, suppliers and the customer from the start to address and resolve issues before delving into execution. This tight program control was a factor in receiving two follow-on modeling contracts, Robertson said.

## LOOKING ABROAD

Another growth area GS&S envisions is expanding its international capabilities. The business unit’s International

Support Systems division is expanding globally through investments and partnerships with local aerospace companies.

“It’s imperative we continue to look for innovative ways to position ourselves in this challenging global economy,” said Torbjorn Sjogren, ISS vice president. “As the world changes, our strategies must be agile enough to react, to help us maintain our market strengths.”

Boeing partner Alsalam Aircraft Co., based in Riyadh, Saudi Arabia, supports the Royal Saudi Air Force and other customers. Boeing Defence Australia serves the Royal Australian Air Force with a broad range of support. In the United Kingdom, Aviation Training International Ltd., a joint venture with Westland Helicopters, trains crews to fly Britain’s Apaches. Efforts are under way for ISS to establish similar ventures in other countries.

By teaming around the world, ISS can capture new business by combining its expertise with that of other companies. For instance, it has teamed with Italy’s Alenia Aermacchi to offer logistics support and training for the M-346 and M-311 jet trainers. GS&S will supply the simulators and logistics expertise; Alenia Aermacchi will supply the aircraft. The approach is a win-win scenario for GS&S, its partner and future customers.

## EYE ON THE GROUND

The final strategy in GS&S’s growth plan is to serve new, non-aviation markets.

Boeing is using expertise gained supporting aircraft fleets to create solutions on the ground. The new Route Clearance Vehicle Modernization Program marks a first step in tactical wheeled-vehicle sustainment. Prime contractor VSE Corp. tapped Boeing as its primary teammate to modernize RCVs that detect and neutralize mines and improvised explosive devices. Under the contract, GS&S will deliver logistics support and supply-chain management services.

“Before the deployment of RCVs, improvised explosive devices were causing death or significant injury to hundreds of U.S. troops in Iraq. We understand the value this program brings, and remember that what we do today may save a soldier or a marine’s life tomorrow,” said Jim Napier, program manager of the Route Clearance Vehicle Modernization Program in Long Beach, Calif.

## PLANS ... AND PEOPLE

Yet just as critical as the growth plan are the people who execute it. The business has adopted a “People First” mind-set that focuses on and partners with employees to engage them in the strategic plan and develop future leaders (see box on Page 17).

“Employees are right at the heart of it,” Muilenburg said. “Competing in our market requires leadership to take a ‘People First’ approach. ‘People First’ means developing people’s skills, encouraging and rewarding risk-taking, insisting on a culture where it is a strength to ask for help. We are being inclusive, leveraging everyone’s perspectives and talents. It’s going to be a high-energy, high-satisfaction place to come to work.” ■

*liz.lane@boeing.com*

# North stars



By Eric Fetters-Walp

**O**n the edge of the Canadian Prairie in Manitoba, a site that quietly has grown into one of the company's largest international manufacturing operations, Boeing employees design and produce key airplane parts.

Starting with just 50 employees in 1971, Boeing's operation in Winnipeg now is the largest manufacturer of aerospace composite parts in Canada, employing more than 1,300 people. Laverne Swanson, a Manufacturing Engineering planner who has worked for Boeing Canada the past 30 years, said the site's contributions to Boeing aircraft are clear. "It makes me proud as a Canadian that Boeing chose to invest in Canada. When I go down to Seattle and see the planes on the production line there, it's nice knowing we contributed to those," she said.

Winnipeg's aircraft fabrication site is the most visible example of Boeing's presence in Canada, but it's just part of a relationship between the company and Canada that spans 90 years. Even as other parts of the globe present new opportunities, Canada remains important to Boeing in myriad ways.

The border between Canada and the United States is the longest common border in the world—a fact made more remarkable by its unmilitarized status. Historically strong ties between these two large trading partners create an ideal foundation for Boeing's increasingly valuable relationship with Canada. Boeing employees deliver products and services to Canadian airlines and defense forces, while Canadian companies—ranging from suppliers and research institutes to the operation in Winnipeg—help Boeing

## Canada at a glance

**Location:** Northern North America, bordering the North Atlantic Ocean to the east, the Arctic Ocean to the north, Alaska and the North Pacific Ocean to the west, and the continental United States

**Area:** 3,855,103 square miles (9,984,670 square kilometers); the second-largest nation in the world and slightly larger than the United States

**Estimated population, 2008:** 33.2 million

**Capital:** Ottawa

**Other major cities:** Toronto, Montreal, Vancouver

**Estimated gross domestic product, 2008:** \$1.33 trillion (U.S.); ranked 15th worldwide

**Estimated GDP growth rate, 2008:** 0.7 percent

**Main export partners:** United States, United Kingdom, China

*Sources: Government of Canada, CIA World Fact Book, World Bank*

**PHOTO:** The Peace Arch at the U.S.-Canada border in Washington state attracts more than 500,000 visitors each year.

SHUTTERSTOCK.COM



“In every facet of our partnership, Canada plays an important role to the success of Boeing.”

– Shep Hill, president, Boeing International

create high-quality products and services used by customers worldwide. Overall, Boeing’s activities generate about \$1 billion in annual economic activity across Canada.

“Canada has been a long-term customer, supplier and partner to Boeing. Today, Canadian carriers operate more than a dozen different Boeing products, and Air Canada and WestJet have new airplanes on order,” said Shep Hill, president of Boeing International. “In every facet of our partnership, Canada plays an important role to the success of Boeing.”

Canada is home to one of Boeing’s largest international supplier bases, with more than 200 suppliers across the country. Canada’s airlines have 224 Boeing airplanes in service and another 77 on order, including Air Canada’s 37 firm orders for the 787 Dreamliner. The nation’s other leading airline, WestJet, flies an all-Next-Generation-737 fleet. “Air Canada and WestJet are great examples of market leading innovators, not just in Canada but in the global airline industry,” said Kevin Schemm, Commercial Airplanes’ vice president of sales for North America.

And the outlook is good for continued demand for commercial airplanes in Canada. Air Canada and smaller airlines, just like others across North America, need to keep updating their fleets. Thanks to expanding ties under the North American Free Trade Agreement and liberalization of the Canada-U.S. Air Transport Agreement, air traffic between the two nations also has blossomed. In the 10 years ended 2008, more than 1,400 weekly flights have been added between the United States and Canada.

Parts of the Boeing airplanes that Canada’s airlines fly originate in Winnipeg, the company’s second-largest fabrication facility outside the United States and a supplier for each of Boeing’s 7-series jetliners. Over the years, the site has earned a reputation for innovation, said Willy Geary, general manager of Boeing Winnipeg. He noted that Boeing Winnipeg is a founding member of the Composites Innovation Centre, which aims for economic growth in Canada through innovative research and development of composite materials.

Dean Hnatiw, 737 senior manufacturing manager in Winnipeg, said he’s proud the operation is known within Boeing for problem-solving when fabrication challenges arise. “Being the size we are makes us very nimble and very reactive,” Hnatiw said. “We’ve been known as a place that can supply solutions.”

Those skills will be put to good use in the future, as Boeing Winnipeg is a top-tier partner on the 787 Dreamliner program, responsible not only for the wing-to-body fairing but also for the airplane’s main landing gear doors, vertical fin fairing, and the engine strut forward and aft pylons.

In addition to the design and fabrication site in Winnipeg, Commercial Airplanes oversees an airline maintenance software



**PHOTOS: (TOP)** With more than 1,300 employees, Boeing Winnipeg is the largest manufacturer of aerospace composite parts in Canada. **(ABOVE)** Willy Geary, general manager of Boeing Winnipeg, stands in front of a 787 engine pylon aft fairing, one of the many components the site makes for Boeing’s 7-series airplanes.

JOHN WOODS/ASSOCIATED PRESS

division, AerolInfo, just outside Vancouver; an airline operations services facility in Montreal; and six aircraft parts service centers across Canada.

While its presence in Canada is smaller than Commercial Airplanes’, Integrated Defense Systems also counts the nation as an important customer. Boeing was selected several years ago to modernize 80 of Canada’s CF-18 jet fighters. That contract’s first phase was done on time and on budget, leading to other opportunities in recent years, said Eddy Morin, IDS representative for Business Development in Canada.

Since then, Boeing has delivered four C-17 Globemaster III airlifters to the Canadian armed forces. Following Canada’s purchase of six CH-47D Chinook helicopters from the U.S. Army last year, Boeing is in the final stages of negotiating to provide its forces with up to 16 new CH-47F Chinooks. “The Boeing reputation is clearly well-established and strong in Canada,” said Morin, a



“Being the size we are makes us very nimble and very reactive. We’ve been known as a place that can supply solutions.”

– Dean Hnatiw, 737 senior manufacturing manager

**PHOTOS: (LEFT)** Canada has purchased four C-17 Globemaster III airlifters in recent years. The Canadian Forces took delivery of the first one in 2007. **BOEING (ABOVE)** Dean Hnatiw, 737 senior manufacturing manager in Winnipeg, checks an engine strut aft fairing. The site makes parts for all of Boeing’s commercial airplane products. JOHN WOODS/ASSOCIATED PRESS

retired brigadier general in the Canadian Forces (Air Force).

Pete Peterson, Canada country director for IDS, said he’s looking forward to more potential contracts, as Canada looks to update its jet fighter fleet. The country also is interested in a multi-mission aircraft similar to Boeing’s P-8A Poseidon. The Canadian army recently purchased the Boeing ScanEagle unmanned aerial system’s services in Afghanistan, and the nation may have homeland security equipment needs Boeing could fulfill, Peterson added.

Again, the relationship between Boeing and Canada flows both ways. To maintain and win military contracts, Boeing has to satisfy Canada’s industrial participation rules. Roger Schallom, IDS’ Industrial Participation manager for the Americas, said those programs contribute greatly to Boeing’s economic impact in Canada. Through industrial participation programs, scores of Canadian companies make components for Boeing commercial and military airplanes, satellites, and simulators for pilots training. The company also has established relationships with Canadian universities to fund research in fields such as visual analytics tools and technology used in unmanned aerial systems.

At L-3 Electronic Systems in Toronto, workers produce color displays for upgraded F/A-18 jet fighters, the C-17 and other aircraft. Boeing is the company’s largest customer, said Arni Olafson, L-3’s F/A-18 program manager. “Our relationship with Boeing is extremely important, and L-3 is proud of having been awarded the Boeing Gold Performance Excellence Award last year,” Olafson said, adding the relationship has made L-3 a better company. “From my personal perspective, Boeing is a demanding customer, but the demands are reasonable, and successful efforts that satisfy requirements are both recognized and appreciated.”

Boeing’s first business with Canada dates back to 1919, when founder William Boeing flew one of his airplanes to make the first international mail delivery between Vancouver and Seattle. Ninety years later, Hill said business between Boeing and Canada is poised to keep growing.

“Canada will continue to grow as a commercial and defense customer and flourish as a supplier partner,” Hill said. “We have the potential to grow our business on both sides of the border and create a long-term, lasting value.” ■

*eric.c.fetters-walp@boeing.com*



# Boeing employees in **Canada**

## COMMERCIAL AIRPLANES LOCATIONS

**Winnipeg, Manitoba:** Facilities totaling more than 700,000 square feet (65,000 square meters) make composite parts for the Next-Generation 737, 747, 767 and 777 airplanes and is a major structures partner for the 787 Dreamliner.

### **Richmond, British Columbia:**

Boeing subsidiary AeroInfo, providing maintenance planning software for airline customers

**Montreal:** Airline operations services facility operated by the Carmen Systems division of Jeppesen

**Ottawa:** Boeing's national office for Canada Aviall Services, a wholly owned Boeing subsidiary and the world's largest diversified aircraft parts distributor, operates six customer service centers across Canada.

## INTEGRATED DEFENSE SYSTEMS PROGRAMS

IDS is the prime contractor to modernize 80 of Canada's CF-18 jet fighters.

Canada purchased four Boeing C-17 Globemaster IIIs in 2007.

The Canadian Department of National Defence announced in 2006 its intention to buy at least 16 CH-47F Chinook helicopters. IDS and SkyHook International Inc. of Calgary, Alberta, are jointly developing a new heavy-lift aircraft designed to transport equipment and materials to remote regions.

Boeing's Insitu subsidiary recently was awarded a contract from Canada to provide ScanEagle unmanned aerial system services.

## INDUSTRIAL PARTICIPATION AND SUPPLIERS

Canada hosts one of Boeing's largest international supplier bases, with more than 200 suppliers across the country.

Canadian partners provide commercial and defense aerospace components for all Boeing commercial aircraft models and the CH-47, the V-22 rotorcraft, aircraft trainers, F/A-18s and the C-17.

Combined with the company's facilities in Canada, Boeing's supply network generates approximately \$1 billion in business annually.

## BOEING CANADA WEB SITE

[www.boeing.ca](http://www.boeing.ca)



**PHOTOS: (TOP)** Tyrone Friesen (left) and Matthew Phill, both trim technicians, sand the core of a 787 main landing gear door at Boeing Winnipeg. **(ABOVE)** Pedro Olid (left), assembly technician, inspects a 787 engine pylon aft fairing with the help of Joe Desousa, 787 engine pylon aft fairing manager (background left), Eric Cuenco, assembly technician-lead hand, and Rich Wieser, technologist lead, at Boeing Winnipeg. JOHN WOODS/ASSOCIATED PRESS

# Winnipeg pursues 'zero-waste' production

Boeing Winnipeg is leading the way toward ecologically sound “zero-waste” manufacturing with a pilot project scheduled to begin later this year.

The site’s 747-8 Engine Strut Aft Fairing area recently held a kaizen—a workshop focused on continual production improvements—to examine energy use reductions and increase materials recycling. Once the plan that the workshop developed is in place, the 747-8 ESAF manufacturing area will be one of the first of its kind within Boeing.

Prashant Rajurkar, environmental specialist at Boeing Winnipeg, said the push to pursue zero-waste-to-landfill goals has come directly from production employees. “The initiatives are coming from the shop floor, which makes my job much easier,” he said.

The Winnipeg site already has taken many steps to improve its environmental performance, including the adoption of point-of-use recycling carts on the manufacturing floor and progressive cooling technology for autoclaves. Last October, the site earned ISO 14001 environmental certification. Indeed, the zero-waste workshop was organized by members of the Continual Improvement Team in charge of the site’s ISO 14001 compliance in partnership with Winnipeg’s Lean organization.

Winnipeg employees have considered many ideas to reduce packaging, leftover metals and general solid waste. Those include using a point-of-use vacuum to collect recyclable metal bits, said Kelly Thiessen, project manager for the 747-8 cell.

As a result of the workshop, the Winnipeg team created a plan that will divert 98 percent of the manufacturing area’s waste away from landfills and reduce energy consumption in the cell by 76 percent. Ultimately, the cell hopes to send no waste to landfills. Rajurkar said achieving that goal will not come without challenges, however. The biggest problem has been finding local recyclers that handle certain plastic materials. “But the company is passionate and our employees are passionate about this,” he said.

Willy Geary, general manager of Boeing Winnipeg, agreed. “Our employees are always encouraged to seek solutions to issues, and we have a very strong Lean department that



**PHOTO:** Prashant Rajurkar, environmental specialist at Boeing Winnipeg, displays the results of a team recycling initiative.

JOHN WOODS/ASSOCIATED PRESS

actively works with employees to streamline our processes,” Geary said. “We have great Employee Involvement teams that are working toward production improvements and ways to reduce our environmental footprint,” he said.

The robust waste reduction steps in Winnipeg come as Boeing has set a target to boost recycling rates to 75 percent and improve energy efficiency 25 percent by 2012 at its major manufacturing sites. “This has the potential of spinning off and benefiting not just Winnipeg but other sites besides us,” Thiessen said.

— Eric Fetters-Walp



# Canada's major airlines

## AIR CANADA

**Headquarters:** Montreal

**Fleet:** 334 long-haul and regional airplanes, including 17 Boeing 777-200LR (Longer Range) and 777-300ER (Extended Range) versions and 30 767-300ERs. Air Canada is a launch customer for the 787 Dreamliner with firm orders for 37 airplanes.

**Customer base:** The nation's largest full-service airline, Air Canada serves more than 32 million customers annually with direct flights to five continents.

**Notable:** Founded in 1937, Air Canada is a founding member of the Star Alliance.

## WESTJET

**Headquarters:** Calgary, Alberta

**Fleet:** 78 Next-Generation 737s; confirmed orders for 43 more

**Customer base:** WestJet serves 55 destinations across North America and the Caribbean.

**Notable:** WestJet recently announced partnerships and codeshare agreements with Southwest Airlines and Hawaii-based Mokulele Airlines and plans to partner with Air France/KLM.

## SKYSERVICE AIRLINES

**Headquarters:** Toronto

**Fleet:** More than 20 airplanes, including Boeing 757-200s

**Customer base:** Skyservice provides flights between North America, the Caribbean and Europe.



## AIR TRANSAT

**Headquarters:** Montreal

**Fleet:** 18 Airbus jetliners

**Customer base:** The airline supports tour operations of Transat AT.

## CANADIAN NORTH

**Headquarters:** Yellowknife, Northwest Territories

**Fleet:** Nine 737-200 airplanes, along with smaller airplanes

**Customer base:** Canadian North provides scheduled charter and cargo service to the Northwest Territories and Nunavut.

**Notable:** Canadian North is 100 percent aboriginal-owned.

## SUNWING AIRLINES

**Headquarters:** Toronto

**Fleet:** Seven 737-800 airplanes year-round, expanding to 15 737s during winter

**Customer base:** Sunwing serves vacation routes to Florida, Latin America and the Caribbean exclusively for Sunwing Vacations.

## CANJET AIRLINES

**Headquarters:** Halifax, Nova Scotia

**Fleet:** Three 737-800 airplanes year-round, expanding seasonally to seven

**Customer base:** Canjet is a full-service charter airline supporting tour operators.

Other Canadian airlines include Air Inuit, Air Labrador, Air North, Cargojet, Enerjet, First Air, Flair Air, Kelowna Flightcraft, Morningstar Air Express, Nolinor Aviation and Porter Airlines.

*Sources: All airlines listed above and Boeing*

**PHOTO:** In addition to flying 17 Boeing 777s, such as the one shown above, Air Canada flies 30 767 jetliners and is a launch customer for the 787 Dreamliner. TIMOTHY STAKE/BOEING

# Harvest moonshine



Ideas generated at Commercial Airplanes' annual Lean+ competition drive efficiency and safety improvements in the workplace

By Dan Ivanis

**K**eith Zanghi wasn't expecting a lot when he turned to the Commercial Airplanes Moonshine War competition for possible solutions to an ongoing ergonomic issue in his work area.

"I really thought we would get back a variation of the process we already had in place, and that would have been fine—anything would have helped," said Zanghi, a production manager in Boeing Fabrication's Skin and Spar operation in Frederickson, Wash. "Instead, I was completely blown away. They came up with a solution that we never would have. It's been a real success story."

For Zanghi, "they" was a team of employees from Boeing Portland, in Gresham, Ore., approximately 120 miles (193 kilometers) south of Frederickson. Despite being new to the Moonshine War—an intense, week-plus annual competition—and having never been to Frederickson, the Boeing Portland team developed a solution that had the Frederickson team

**PHOTO:** Keith Chigbrow, a mechanic in Boeing Fabrication's Interiors Responsibility Center in Everett, Wash., uses a tool developed during the 2008 Moonshine War that eases loading of pilots' chairs into 777 overhead rest modules. GAIL HANUSA/BOEING

talking: an automated, 34-pound (15-kilogram) tool that could replace a repetitive, hands-on process involving a 600-pound (272-kilogram) tool.

"Everyone in our shop is really excited about this. The automatic operation could make people's jobs much simpler and much safer," Zanghi said. "The basic concept has the potential to be applied in other parts of our operation and at other locations."

Based on a now-defunct cable television show called "Junkyard Wars," the annual Moonshine War competition, sponsored by Commercial Airplanes' Lean Enterprise Office, pits teams of Boeing employees against one another in a contest to develop the best solutions to actual workplace efficiency and safety issues. (From a Lean perspective, "moonshine" is the



“I was forced to think in new ways. I had a lot of questions as we went along. And by asking those questions, I forced our engineers to think in different ways.”

– Joy Koppes, estimating and pricing specialist,  
Finance



practice of resolving issues by creating mock-ups and performing simulations with inexpensive, available resources.)

Prizes are awarded to winning teams, including the grand prize: a trip to Japan for a week of intense Lean training. However, the real winners often are the organizations that capitalize on the ideas generated at the competition to improve efficiency and safety in their work areas.

### FIRST, INVESTIGATE

Since the event's birth in 2002, both the Moonshine War and the challenges it addresses have evolved. Focused on efficiency in the early years, in 2009 the Environment, Health and Safety organization became involved in the Moonshine War and safety and ergonomic solutions were given priority in judging. That reflects Boeing's new, companywide workplace safety effort—Safety Now—and five-year targets for improving workplace safety.

During the Moonshine War, teams of five or six use the Production Preparation Process (3P) to investigate problems, dream up ideas and build mock-ups to demonstrate their solutions (see the sidebar at right). Each team receives a budget of \$1,000 for materials, although few use it all. But most do spend every available hour, and then some, to solve the challenge.

“It was a very intense week, with a lot of late nights and long hours,” said Andy Mott, a Propulsion Systems engineer and two-time participant. “It is an exhausting experience, but it's also invigorating and rewarding. You learn all-new ways of thinking, and it gives you a chance to go out and work with your hands, which I don't get to do often.”

A unique characteristic of the Moonshine War is that teams are not allowed to work on issues from their own work areas. Although teams usually are made up of members from the same geographic areas, their experience and expertise vary.

For instance, one member of the Boeing Portland team that designed the tool and process for Frederickson was Joy Koppes, an estimating and pricing specialist in Finance, who was less than a year out of college and had no factory experience.

“We had a very diverse team with one person from the factory, two engineers and two people from support organizations,” said Koppes, who has since joined the 787 Dreamliner team in Everett, Wash. “Our diversity forced each of us to think outside the box. I certainly had a different

## Production Preparation Process (3P) is one Lean technique used during the Moonshine War

### Purpose

Improve the flow of a production process by developing effective designs and processes that focus on transformational steps.

### Benefits

- Right-sized assets
- High-quality products
- Standard, reliable methods
- Dramatic reductions in cost, inventory and lead time

### Key deliverables

- A simulation of the improved process
- An implementation plan
- An equipment development plan
- Resource requirements
- Timeline
- A right-sized flowing production system

For more information, visit the Lean+ Web site on the Boeing intranet (<http://leo.web.boeing.com>).

**PHOTO:** Chuck Duncan, a mechanic at Boeing Fabrication's Skin and Spar operation in Frederickson, Wash., attaches a prototype automated shot peening machine to a wing panel. The device will replace a manual process that involves a 600-pound machine. **ED TURNER/BOEING**

perspective, given my background in finance, and I was forced to think in new ways. I had a lot of questions as we went along. And by asking those questions, I forced our engineers to think in different ways.”

Teams from Canada and Australia also have taken part in the Moonshine War, communicating electronically with the competition going on in Seattle.



## The 3P Creative Process used during the Moonshine War stimulates creative thinking

1. Define the function, theme and scope
2. Use keywords to define the function
3. Find examples of the keywords in nature
4. Examine what's happened; sketch and post examples
5. Sketch the background and conditions
6. Combine ideas and create sketches of them; think of at least seven ways
7. Select the best proposals
8. Construct prototypes; continue "moonshining," or innovating
9. Conduct simulations
10. Gather and evaluate data; keep moonshining
11. Review the process with the customer to select the top design

**PHOTO:** Moonshine War participants present to judges and observers at the 2009 event in Seattle. **JIM ANDERSON/BOEING**

### SHOT PEENING MADE EASIER

The challenge the Boeing Portland team addressed had to do with the repetitive nature of the shot peening process in Frederickson, where huge sheets of raw aluminum are transformed into meticulously formed wing panels for 737, 747, 767 and 777 airplanes.

Shot peening is used to finish the surface of a part. The surface is hit with shot—miniscule round particles—that act as tiny ball peen hammers. The process enhances structural fatigue performance by imparting a compressive stress layer at the surface of the part. Shot peening machines vacuum up the particles immediately as they hit the surface.

Throughout the manufacturing process, wing panels are transported between stations by overhead cranes, which hook into

tabs that protrude from each panel edge. Just before the panels are shipped to their respective assembly plants, the tabs must be cut off and the raw, exposed areas must be shot peened before being treated and painted.

To shot peen these areas, mechanics must wheel 600-pound (272-kilogram) Vacu-Blast machines along the length of the panel, stopping to run the heavy shot peen head over the exposed area 50 to 60 times before moving on.

"We have some mechanics here who weigh less than 125 pounds (57 kilograms), and they have to fight this machine up and down the length of a 777 wing panel," Zanghi said. "The repetitive nature of the work also is a stress on arms, shoulders and necks."

The Portland team's solution is a self-contained, 34-pound (15.4-kilogram) shot peening machine that clamps onto the edge of the wing panel and does the back-and-forth work automatically. Skin and Spar employees are studying ways to reduce the weight even more. A 6-pound (approximately 3-kilogram) derivative also is being studied for other uses in Skin and Spar.

The shot peening process is just one of many solutions that have emerged from the Moonshine War and have been implemented as is, or with minor modifications, since the competition began in 2002.

### MOVING CHAIRS

At Boeing Fabrication's Interiors Responsibility Center in Everett, manager Howard Hampton and mechanic Keith Chigbrow are benefiting from a solution developed during the 2008 Moonshine War.

As part of their work statement, Hampton and Chigbrow load special, but bulky, pilots' chairs into a small module that is part of the overhead crew rest areas on some 777s. The chairs, which weigh approximately 80 pounds (36 kilograms) each, are the last items to be loaded before the module is shipped.

Before the Moonshine War solution was implemented late last year, loading the chairs was awkward at best. It took two employees to physically lift each chair about four feet (1.3 meters) off the ground and balance it on the lip of the module's rear opening. While one employee held the chair in place, the other would crawl in from the other side and, from his knees, lift the chair again before lowering it into position.

In addition to the obvious ergonomic issues, Hampton also faced scheduling problems. "If I had only one person on second shift, they couldn't do the job," he said. "We always had to schedule around the fact that it took two people."

Thanks to the "Propulsion Fuelers," a Moonshine War team made up of propulsion installation and fuel system engineers from Everett, now one person can do the job.

The Propulsion Fuelers solution is a lightweight, wheeled tool that features a lift mechanism, run by a battery-powered drill motor, and a manual arm extension mechanism. To load the chairs now, Chigbrow attaches the tool to the back of the chair, uses the lift to raise the chair, wheels the chair to the module opening and then uses the arm extension mechanism to move the chair gently into place.

"This is a lot safer than the way we used to do it," Chigbrow said. "We would have to jiggle it back and forth to get it in its tracks. Now it just drops right in. I'd just like to thank the people who designed it."



“You pick up part of an idea here, and another part there and you think, ‘We could do something like that back where I work.’ ”

– Darren Melhart, four-time Moonshine War participant

## MIRACLE TOOL

At Integrated AeroStructures in Boeing Fabrication’s Auburn, Wash., facility, process engineers Rich Alexander and Mike Milby turned to the Moonshine War when they were looking for a solution to eliminate a workplace safety concern and relieve a production bottleneck at the facility. Within its million square feet (93,000 square meters), Integrated AeroStructures produces aluminum sheet metal, aluminum extrusion and assembly commodities.

The issues were the time, effort, and safety and ergonomic concerns involved in deburring—or finishing off—thousands of tiny holes in outboard stow-bin rails destined for 777s. The rails, which are part of the support structure for stow bins, have holes at 1-inch (2.5-centimeter) intervals and run throughout the airplane. For example, a typical 777-300ER (Extended Range) has approximately 11,300 stow-bin holes.

Before the Integrated AeroStructures team implemented the moonshine solution, mechanics had to debur the holes with hand-held power tools, which led to fatigue and was a prime environment for repetitive stress injuries. The prototype solution, developed by a team from Everett that represented both the Emergent Operations Facility and Right-Sized Equipment, is an automated tool that travels along the rails, deburring the holes as it goes. Mechanics simply attach the tool and let it do the work, freeing them to do other tasks.

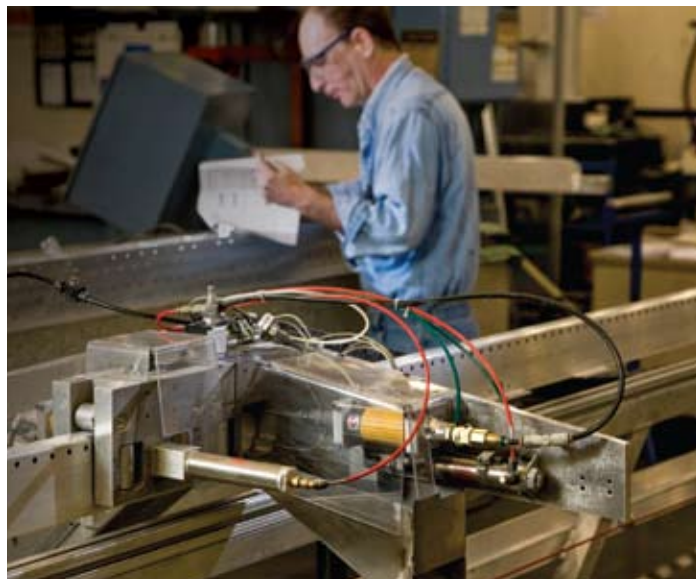
The tool has relieved both the bottleneck in the factory and the workplace safety concerns.

“An added benefit is that our quality has improved from the manual process,” Alexander said. “We no longer have elongated holes caused by hand-held tools going in at an angle.”

Alexander and Milby have made some changes to the original tool. “Their concept was right along the lines of what we had envisioned,” Milby said. “Having a working prototype is very helpful. You can quickly see what works and what can be improved. Overall, it shortens development time and leads to a better product.”

Darren Melhart, a mechanic at the time, was a member of the team that designed the deburring machine. Now a member of the Commercial Airplanes Lean Enterprise Office, Melhart has participated in four Moonshine Wars.

“I live for that kind of competition,” Melhart said. “One of the best parts of the Moonshine War for me is the report-out. Everyone in the room is studying everyone else’s ideas very



**PHOTO:**The automated deburring machine (foreground), developed during the 2007 Moonshine War, has increased safety and quality at Boeing Fabrication’s Integrated AeroStructures operation in Auburn, Wash. **ED TURNER/BOEING**

closely, and they are all taking mental notes. You pick up part of an idea here, and another part there and you think, ‘We could do something like that back where I work.’ ”

## BRIGHT IDEAS

Billy Roeseler, an Associate Technical Fellow supporting Advanced Concepts and Commercial Airplanes’ TheConceptCenter, in Everett, is a big fan of the Moonshine War and the kind of thinking it inspires.

After participating in two of the early competitions, Roeseler, then working on the 787 Dreamliner, submitted an issue regarding the join of the 787 wing and its raked wingtip. Although none of the solutions that emerged from the Moonshine War was implemented, the ideas inspired the 787 team to look at the issue in a different way and develop innovative solutions of its own.

“Some of the out-of-the-box thinking that I saw at the three Moonshine Wars I was involved in was really world-class,” he said. “The fact that the Moonshine Wars bring in nonexperts to work on these issues can be a big advantage. Experts have a habit of getting tunnel vision. People from outside are not constrained by preconceived notions.

“The Moonshine War is so important because it brings in the manufacturing function,” he continued. “You actually have to build and demonstrate the technologies. It is not just sitting at a computer and dreaming up bright ideas, but actually working with your hands and putting them into reality.”

And then putting them to work in the workplace. ■

*daniel.j.ivanis@boeing.com*

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# Small starts lead to green gains

Employees in Commercial Airplanes Fabrication boost recycling to eliminate waste, generate savings for Boeing, suppliers



**PHOTO:** Ron Misko (left) and Allan Merced, with the Fabrication Interiors Responsibility Center in Everett, Wash., recycle end-wall cradles. The plastic ends support and protect the ends of rolled material received from suppliers. GAIL HANUSA/BOEING

By Robin McBride

“It really started out with one item,” recalled Ron Stever, a Commercial Airplanes Fabrication employee who leads the Fab “green team.” For Stever and his colleagues in the Interiors Responsibility Center in Everett, Wash., that one item in 2007—the year Boeing announced aggressive environmental targets to increase recycling 25 percent by 2012—set off a departmentwide recycling and reuse effort that continues to reap rewards for Boeing, its suppliers and the environment.

The item? Wood pallets. Within the IRC, the Raw Materials team identified a way to reuse the wood pallets that they previously would have thrown away. With that first step, and the support of operations manager Mike Green, the Raw Materials team eventually joined other ecology-minded IRC work groups to form the facility’s “green team.” Led by Stever, IRC stow-bin operations manager, green team members have helped the IRC significantly improve its environmental performance.

Employees at the IRC design, manufacture, assemble and integrate a wide range of interior systems for commercial airplanes, including crew rest areas, stow bins and partitions. The IRC also supplies those systems to the Spares organization for retrofitting airplanes already in service. On any given day, the IRC Raw Materials team receives as many as 15 shipments from suppliers. Because of the sheer volume, Stever and the green team knew they could make specific, sustainable environmental improvements.

“Identifying the right project was the first step in the process for us. We knew we could improve our recycling and reuse efforts significantly,” Stever said. “We just needed to step back and focus on one improvement at a time.” Green suggested the green team find out what happened to the packaging materials—mostly new wood pallets—after shipments were processed.

“We noticed a common pattern,” Green said. “Once the supplies were removed, the empty pallets were crushed and thrown away. That meant 60 to 70 pallets, which were in perfect shape, were being scrapped each week.”

Armed with that information, the team identified a potential solution and contacted Boeing supplier Cytec Engineered Materials. The new process optimizes the current shipping process: Previously, Boeing Transportation arranged through a local carrier in Washington to transport each shipment of fresh material from the California supplier to the IRC. Now, the carrier starts each trip at the Everett site, where the team loads the truck with the reusable materials. The carrier then transports the items to California, delivers them, and then loads and carries the ordered shipment back to Washington.

The first load of recycled materials took about three hours to situate in the truck and resulted in some lessons learned. “All loads after that have taken 30 minutes or less to load,” said Kurt Watson, of the IRC Raw Materials receiving and warehousing group. The new process represents a savings of approximately 8.25 tons (7,484 kilograms) of waste and an estimated \$7,025 (less any pallet reconditioning costs).

With that success under its belt, the green team began to see everything in the factory a little differently, according to Stever. Before long, the team found ways to reduce, reuse or resell nearly every type of packaging material delivered to the IRC.

Since the first experimental truckload 10 months ago, the green team has worked with Cytec to take back other shipping components such as end-wall cradles and plastic



“The key to the future—our future—is to continue to involve people. Keeping it simple and focusing on the small stuff will amount to big savings over time.”

– Mike Green, Interiors Responsibility Center, Raw Materials Operations manager



**PHOTO:** Thanks to these engaged employees in Everett, Wash., some materials once discarded are now reused: Ron Stever (left), Michael Green, Rodney Rutt, Curtis Watson, Fausto Ochoa, Steven Knoblauch, Marvin Knoblauch, Barry Smith, Blaine Smith, Albert Stivala, Ron Misko, Andrew Schrader, Kenneth Blanchard. Not shown: Diane McClay, Daryl McElroy and Allan Merced. GAIL HANUSA/BOEING

foam. Today, the IRC has successfully returned more than 65 percent of pallets and shipping materials for reuse back to this supplier—representing more than 33 tons (nearly 30,000 kilograms).

This success has set the example for workplace reuse and recycling in the IRC. Now when someone in the shop points out a potential for reuse, team members don't hesitate to contact the supplier to see whether there's an opportunity to work together. "We've found that many of our suppliers are eager to work with us on environmental projects," said Ron Misko, a green team member who works in the receiving and warehousing group within IRC Raw Materials.

No idea is too small for the IRC green team. For example, the team also found a way to reuse safety glasses. Instead of being thrown away, used safety glasses now go to Veterans Independent Enterprises of Washington, a disabled veteran's organization near Tacoma, Wash., which refurbishes and

repackages the glasses before returning them to Boeing, for a savings of 30 percent per pair.

As word spreads about what teammates have been able to accomplish, the IRC green team keeps growing. It now has more than 25 members from across the IRC, up from six just a year ago.

"The improvements we've made in the IRC are good, but they are just the tip of the iceberg," said Beth Anderson, IRC director. "We have outlined aggressive goals to continue reducing our solid waste, energy consumption and overall carbon footprint. Our plan is at least one zero-waste-to-landfill manufacturing cell by the end of the year."

"The key to the future—our future—is to continue to involve people," Green said. "Keeping it simple and focusing on the small stuff will amount to big savings over time." ■

*robin.m.mcbride@boeing.com*

# 20

# tips to boost your performance

If there's a silver lining to the current economic climate, it may be this: There's never been a better opportunity to get creative about performance development. Why? Because as Boeing teams enterprisewide strive to continuously improve their performance, products and execution while conserving resources, each of us has the opportunity to step up and do our work better and smarter. There are always ways you can stretch your skills in your current position. How? Try these simple tips, many of which require only the investment of time.

**1. Get SMART.** Set your Performance Management business goals carefully using the SMART framework (S – Specific; M – Measurable; A – Achievable; R – Relevant; and T – Time-phased). These goals, and your performance against them, tie to year-end performance evaluations and subsequent salary decisions.

**2. Find a mentor.** If no mentoring programs are available at your level, find someone on your own whom you admire and set up an informal arrangement. Ask about the path he or she has taken and how this person overcame the challenges encountered.

**3. Get involved.** Lend your talents to help your community—and at the same time stretch your workplace skills and showcase your leadership capabilities. Use your project management skills to help a school create a mentor program. Use your leadership ability to organize a tree-planting event. Use your Lean knowledge to help a food bank serve more people in these hard times. Volunteer, through work or on your own, and show people what you are capable of.

**4. Link up.** Join an affinity group—Boeing employees who meet regularly to promote diversity and inclusion, advance personal and professional development, work on business projects, and participate in

community service efforts. You'll help raise awareness and increase understanding of the many cultures in our work force and help with mentoring programs—and you can take advantage of new learning and leadership opportunities.

**5. Learn from those around you.** If someone you work with does an excellent job in an area (such as data analysis, project management, providing feedback), ask that person to help you build the same skills or to share a tool or process that enhanced his or her success.

**6. Talk about it.** Talk about performance regularly and candidly with your manager, not just during formal review periods. Regular performance discussions help you get immediate feedback on how you're doing. They also enable midcourse corrections, if necessary, and ensure there are “no surprises” during your end-of-year performance appraisal.

**7. Invest in yourself.** Boeing makes this easy by offering a number of opportunities for personal growth. One resource is Learning Together, Boeing's tuition assistance program. Learning Together allows Boeing employees to enroll in education programs that develop critical skills that support the business. And hundreds of online courses are available through My Learning on TotalAccess. Learn more by visiting <http://ltd.web.boeing.com> on the Boeing intranet.

**8. Learn to think in questions.** By asking critical questions, you often can uncover answers that will help you do a better job or improve a process.





**9. Chart your course.** Don't be afraid to assume leadership. People always think of leaders as the person in the corner office, but there are leaders at every level, across Boeing, demonstrating the Leadership Attributes, which fuel company growth. To learn more about Boeing's Leadership Attributes, visit [http://boeingnews.web.boeing.com/leadership/leadership\\_attributes.ppt](http://boeingnews.web.boeing.com/leadership/leadership_attributes.ppt) on the Boeing intranet.

**10. Play up your strengths.** Is there something you like to do and do well? Define your strengths and determine how you can use them to advance key projects. Maybe there's something you're doing that can be shared with your team—or even with the entire company. Sharing replicable tips and best practices with others helps support the companywide growth and productivity initiatives. You also can volunteer to mentor others who may be weak in your area of strength.

**11. Cross-train.** Make yourself more valuable. Seek opportunities that allow you to learn new skills or utilize a new technology. If a team member is on a temporary assignment, volunteer to take on his or her responsibilities for a defined period. Is there an exciting new program under way? If a cross-training opportunity is available in your area, talk to your manager about how you might be able to take on a role, however small, as a developmental opportunity.

**12. Eliminate waste.** Improve the product or service you provide by finding ways to do things more effectively and efficiently. Cut waste from your team's processes and procedures. That frees up time and resources that can be devoted to new and creative endeavors, increasing the opportunity for personal and team success and growth. If you're not sure where to begin, visit the Lean+ site on the Boeing intranet at <http://leanplus.web.boeing.com>.

**13. Style matters.** Understand your preferred learning style when setting a development goal. Do you learn best in a formal classroom setting, interacting in a hands-on environment or through a self-paced online tutorial? Knowing your learning style will help you choose developmental opportunities that are best for you.



**14. Learn from failure.** Celebrate your successes, and learn from your mistakes. After every challenging project, ask yourself three questions: 1) What did I intend to happen? 2) What actually happened? 3) What will I do differently next time? Understand which behaviors or strengths made you successful and replicate them in other work that you do. Likewise, think about times when you've made a mistake. What learnings can you apply from your experience?

**15. Network.** Venture both inside and outside the company to learn best practices and keep up with the latest trends. Collaborate and share war stories with your Boeing colleagues. Get started by signing up for inSite (under "Popular Sites" at <http://inside.boeing.com> on the Boeing intranet), Boeing's social networking tool, which allows you to ask questions, find people and share information in your specific area or with any inSite network you select.

**16. Set goals.** Where do you want to be one, five or 10 years down the road? When creating your Performance Management business goals and development plans, keep your future in mind. Remember, the goals you set and your performance against them may be used in future hiring decisions or succession plans.



# Resources

## to help you take charge of your career

Boeing offers a variety of easy-to-access resources to get you started—including sites on the Boeing intranet.

- **Learning Together:** Under this program, Boeing pays for tuition and many related expenses for employees enrolled in courses at accredited universities and institutions. Learning Together allows Boeing employees to choose education programs that enhance job performance, intellectual growth, build critical skills and professional development. (<http://learningtogether.web.boeing.com/index.aspx?com=1&id=1>)
- **Boeing Education Network:** An interactive televised system providing training for Boeing employees, the Boeing Education Network extends opportunities for learning to more than 60 sites across the enterprise. (<http://lead.web.boeing.com/ben/ben.html>)
- **Boeing Enterprise Staffing System:** Providing an integrated approach to effectively manage the hiring process, the Boeing Enterprise Staffing System, or BESS, makes it easier and quicker for employees to find and apply for jobs that match their career goals. (<https://bess.web.boeing.com>)
- **My Learning:** My Learning on TotalAccess is the Boeing resource for all training and certification requirements. This comprehensive learning management system promotes performance development by allowing employees to develop learning plans that align with their career goals. (From the MyBoeing employee portal, click on TotalAccess and select the “My Learning” link.)

**17. Take a chance.** Don't be afraid to take a risk. Eighty percent of development occurs on the job, in experiences that take you to the edge of your comfort zone. Growth occurs when you stretch yourself and even when you fail (see Tip No. 14). And remember, never compromise values in the name of getting a job done. Ethics and compliance are part of Boeing's competitive strength. There is no tradeoff between execution and ethics.

**18. Offer solutions, not just problems.** Got a problem that you want to talk to your boss about? If so, be prepared with at least one possible solution before you walk into his or her office. Even if your manager doesn't agree with what you've come up with, your solution-oriented approach will be appreciated.

**19. Let your voice be heard.** The Employee Survey is a great chance for you to let Boeing and your manager identify ways to make the company even better. From May 18 through June 15, the 2009 Boeing Employee Survey will be available worldwide for all full-time and part-time employees—including those in some subsidiaries. In addition to completing the survey, volunteer for your group's action-planning team to work on solutions to any issues the survey brings to light.

**20. Hang in there.** If you find yourself lacking energy and feeling stressed, Boeing offers a one-stop online stress-management resource at [www.boeing.com/stressmanagement](http://www.boeing.com/stressmanagement). In addition, the Employee Assistance Program is available to address a variety of concerns. Employees and eligible family members can access an experienced counseling professional for up to six free counseling sessions. In the United States, call 1-866-719-5788. Outside the United States, call Canada collect at 1-905-270-7658. Another resource for stress management and healthy lifestyle information is [www.BoeingWellness.com](http://www.BoeingWellness.com). ■

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PETER CORWIN, DAVID BRINKO/SPACE CRAFT  
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# Engagement:

## A common link among high performers

By Susan Birkholtz

**E**ngagement—in your position, on your team and in the company you work for—is the common link among all top performers, at Boeing and at any company. In fact, a 2006 Conference Board study found that highly engaged employees outperform their disengaged colleagues by 20 to 28 percent.

Improving employee engagement is important to Boeing and is a business imperative for managers who are responsible for keeping their employees engaged.

This responsibility is never far from the minds of John M. Tracy, Integrated Scheduling–Global Strike Systems Integrated Product Team, and Cindy Gossett, chief engineer for 747/767/777 Systems Engineering. Here's what they had to say about the link between engagement and high performance.

"Highly engaged employees ask questions about every aspect of their assignments," Tracy said. "They take ownership, seek out challenges and look for ways to make a significant contribution to the team. They are not about 'Just tell me what I need to do; I'll do it and no more.'"

Gossett offered a similar description. "Engaged employees love their job, and some say they'd do it even if they didn't get paid for it," she said. "When they talk about The Boeing Company, they use the pronoun 'we,' not 'they.'"

Not surprisingly, Tracy and Gossett see a lot of overlap between employees who are highly engaged and those performing at the top of their game.

"I think it's very important that employees are engaged in their work in order to understand what's really required to be successful. It's natural for engaged employees to take extra measures to ensure a successful result," Tracy said.

Gossett agreed: "Being engaged is a necessary condition to becoming a high performer. Being aware and a part of what's going on in the larger group beyond their own jobs helps employees feel ownership for the goals of an organization. All this leads them to perform in a more stellar way."

In a challenging business environment, employee engagement—and the higher levels of performance that can result from it—is more important than ever, according to both managers.

"When business is tough, it's especially crucial to engage your work force in making a difference—in performing leaner and smarter and being active in efforts to improve processes and quality and reduce waste. If they're engaged, they will do all this because they care; they see themselves making a difference and want to be part of a winning team," Tracy said.

Gossett also believes that keeping employees engaged becomes even more critical when times are tough. "Communicating more often and openly during tough business cycles and reductions is vital," she said. "I encourage employees to talk about the things they can influence, and then work from there. It's important to involve people in some of the decisions so they feel empowered to every extent possible."

The Employee Survey (May 18–June 15) is an especially valuable tool for managers in challenging times to identify any gaps in the engagement levels of their employees.

In fact, Tracy credited addressing his team's survey results through candid conversations and action planning for his team's high levels of engagement. "I review my survey results with the group and have candid discussions about my strengths and weaknesses. I ask for input on how I can improve as a leader," he said.

Brandon Myers, an integrated scheduler in St. Louis, used to be a team lead in Tracy's group and reported to him. His experience with Tracy is still very rich in his mind.

"John encouraged me to learn all I could about the products being built and encouraged me to understand how my job fits into the big picture," he said. "A manager who takes the time like John did is critical, not only to staying engaged but also in performing—wanting to perform—at my best." ■

*susan.l.birkholtz@boeing.com*

**PHOTO:** John M. Tracy (left), manager in Integrated Scheduling for Integrated Defense Systems, and Brandon Myers review metrics. According to Myers, Tracy played a critical role in his staying engaged and wanting to perform at his best. RON BOOKOUT/BOEING



Own your performance and career:

# Employees share secrets of success

By JoAnn Houlihan

**M**eet six Boeing employees who consistently strive to get to the top of their game. Learn about the turning points that shaped their careers, priorities that keep them balanced and what they plan to do next. As you'll discover, their secrets to career growth are not so simple to pinpoint. Looking at their combination of diverse experiences, you'll quickly see that it is in the way they define and measure success—on their own terms and in every aspect of their lives—that has shaped their performance and opened the doors to possibility.

## Will Station

Senior manager, St. Louis Accounting Operations, Integrated Defense Systems

*When he was 14 years old, Will Station wrote down the milestones he wanted to achieve throughout his life. Guess what? He still has that piece of paper and has hit every one. This lifelong learner started to give 100 percent at an early age and attributes his career success to the ability to line up actions with ambitions.*

**Current focus:** In accounting, we write journals—some being hundreds of pages long—that require the use of several resources to print, scan, ship and store. We recently used Closed Mitts, a Lean+ tool that helps identify and eliminate waste, to improve our journal process. Prior to this exercise, our journals would start off electronically, were then printed, reviewed and then scanned back into an electronic format. From there, they were shipped to storage. Now, with our paperless journaling, we keep it electronic throughout the process and have eliminated the use of resources to print, scan or store our journals. We were also able to reduce our handoffs from five to only one and leverage Boeing's resources by using our internal Document Management Services group.

**Leadership style:** I focus on building relationships with my employees. You won't find me in an office all day. I can communicate with them through e-mail or Instant Messenger, but I'd rather go right to their desks and talk through an issue. I get to know my employees, so I understand what motivates them. And it works for me. I have high-functioning teams.

**What drives him:** I do not compete with others; I compete with myself. I made a list when I was 14 of where I wanted my life to be at various stages. Reaching the goals outlined on that sheet of paper has been my primary source of motivation.

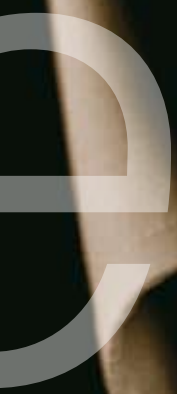
**Making time for his family:** I have a wife and 1-year-old son, and I am also working on an executive master's degree. To make it all work, I schedule "nonnegotiable" time. Those are the hours after work that I focus on my family. I don't log on to my computer or use my BlackBerry. When they go to sleep, then I will go online and get connected.

**Whom he admires most:** I admire Tiger Woods because he has devoted himself to his profession. Even though it's golf, that's his job and he is always trying to build new skills and learn. He is a student of his career.

BOB FERGUSON/BOEING

aspire





# believe



## Torriy Hidde

Staff analyst, Support Cells, Commercial Airplanes

*Torriy Hidde believes you can have it all, if you're willing to step it up. As the first staff analyst for her 777 support cell, she uses the discipline she learned in the U.S. Navy to help the organization understand how quality, cost, safety and headcount affect the core business. She also juggles two other roles: student with plans to graduate in May with a bachelor's degree in business (and a double major in accounting and finance) and single mom to a 3-year-old daughter.*

**How the Navy shaped her:** My five years in the Navy was such a driving force in who I am today. I miss the camaraderie of the military and am sad I left, but I left to spend more time with my daughter. Fortunately, I have found the same kind of camaraderie here at Boeing. My experience there led to so many other opportunities, like coming to Boeing. Without that work history and what it instilled in me, I wouldn't be where I'm at right now.

**Being a role model:** I want to show my 3-year-old daughter that you don't have to rely on anybody else in the world to be successful. I am a woman and single parent. Yes, I have mornings that I'd like to roll over and call in sick, but I don't want her to see me giving up. If I'm not there to show her what morals and values are important, then who is she going to learn it from?

**Testing the limits:** If I don't feel a question is being answered, I keep on trying. Sometimes you'll hear, "This is the way it's always been." Well, that's not an answer. I believe in pushing the envelope and never settling.

**Who inspires her:** I remember hearing Elizabeth Lund, who was a 777 director at the time, speak when I first came to Boeing. She is a firecracker who has all of this energy and passion. She knows the business and what she's talking about. I'm glad she had the opportunity to move up, but I would have loved to be mentored by her. When she talks, people listen.

**Long-term goals:** When I look at the annual report, I always go to the executive photo page. There are usually only one or two female executives in the photo. Since finance is my specialty, I want to see my picture in that report running the finance organization. I'd also like to see a woman running Boeing some day. Who knows ... maybe it will be me.

GAIL HANUSA/BOEING



# Pat Cazeau

Functional manager, Guidance, Navigation and Control Satellite Systems Flight Engineering, Southern California region, Integrated Defense Systems

*Pat Cazeau has a lot to be proud of—Massachusetts Institute of Technology graduate, patent holder, father and line manager with responsibility for leading and inspiring 85 employees. In 2007, he also was honored with a Black Engineer of the Year – Modern Day Technology Leader award, which recognizes up-and-coming professionals who achieve excellence in the areas of engineering, science and technology. Success, he believes, stems not just from hard work but also from the ability to communicate, build trust and foster strong relationships.*

**Moment that changed his career:** I was working on a team to implement a new control system on a satellite when the whole thing failed and an immediate redesign was needed. It is very rare to get a satellite with control instability, so there was a lot to learn from redesigning that piece, as the new technology required some innovation. This could have been my greatest disappointment and cost me my job. Instead, it was career-changing because it opened doors and changed my perspective on how to do work here.

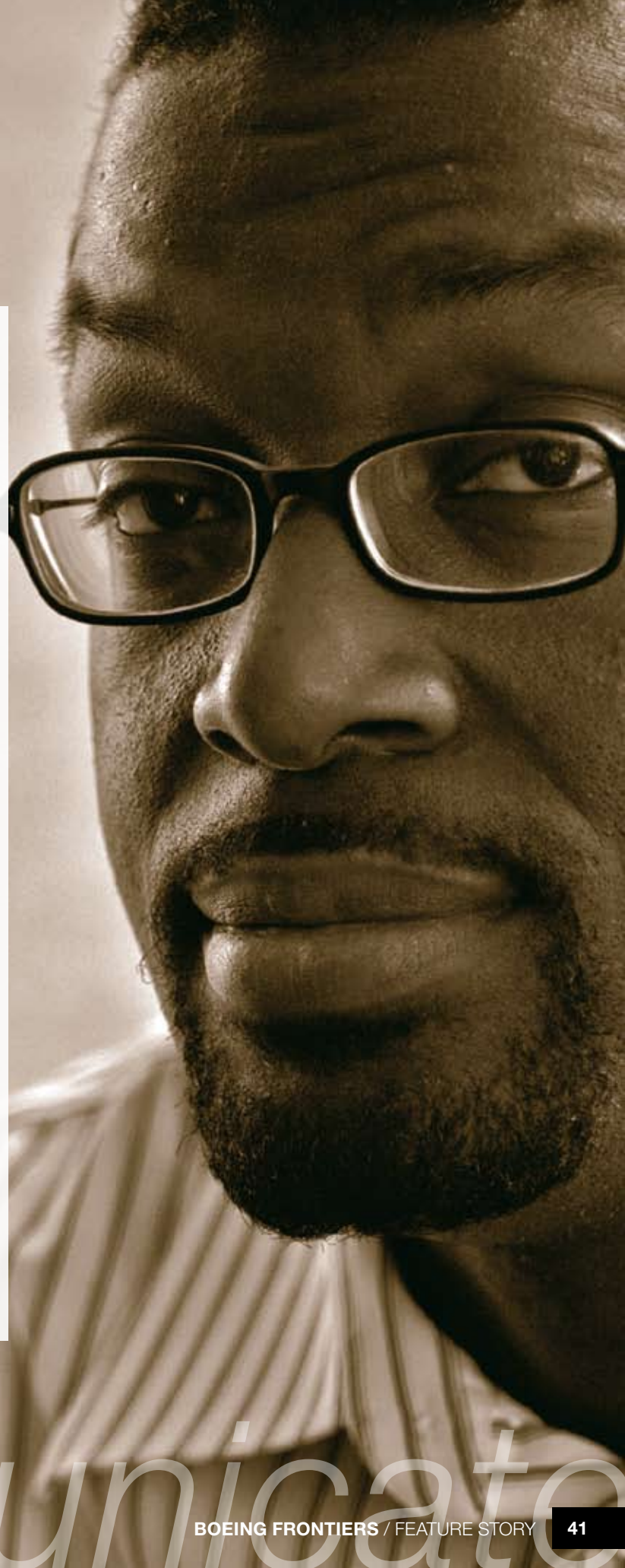
**Performance development:** If you're a technical contributor, there's a lot you can contribute. But if you're going to continue to grow, being able to lead is going to be a huge aspect of your career. A big part of that is how you communicate with others. Taking the time to promote open communication in your group leads to trust and stronger working relationships. You'll also be able to influence your team and vice versa so you can make the right decisions.

**Being mentored:** Jack Yoakum, who is retired, was a brilliant engineer and very humble. He had a diversity of skills, both technical and people. He gave me and other junior engineers a lot of time and really made it a fun place to work.

**Managing work and life:** If you're in aerospace, you must have passion. I enjoy my work no matter how hectic it gets. But the same way I carve out 40-plus hours for work, I set aside time for my family, children and hobbies.

**Whom he admires most:** I am the sixth of seven children, born to an immigrant family from Haiti. As a parent, I grow more every day in admiration of my dad. He continues to be my compass and the best example of how to work hard and have patience and concern for others.

PAUL PINNER/BOEING





# focus

## David King

767 Boeing Converted Freighter Program manager,  
Commercial Airplanes

*With roots in the Peace Corps and an entrepreneurial spirit, David King's current focus has him preparing for increased market demand for the conversion of aging planes into freighter aircraft when the global economy recovers. Giving definition to ambiguity and measuring progress along the way has fueled his ability to succeed under pressure. His secret? A belief that anything is possible.*

**Volunteering can shape a career:** I spent two years in Tunisia serving in the Peace Corps. My role was to work with communities to share building construction practices and promote a housing program that the United States and Tunisian governments were sponsoring. It wasn't a typical job where your boss would swing by and check on deadlines. This experience was career-shaping because it challenged me to build a framework in how to define what needed to get done and how I was going to get there.

**Taking a chance:** Upon completing Boeing's Enterprise Auditor Program, I was offered a tremendous opportunity outside the company to work at a startup. It was a unique company that had a concept for a new, value-priced, twin-engine six-seater jet. The environment there was definitely entrepreneurial, and at first I had a hard time adjusting to a place that had no formal processes or even copies of supplier contracts that were organized in one location. The rate at which things changed and developed was incredible. Even though the company did not succeed, the experience was important because I think I brought that entrepreneurial spirit back to Boeing.

**Balancing work and life:** I establish ground rules. When I was part of a new program that required a lot of travel and late nights, I sat down with my wife and we discussed how our life would be. That way, a lot of the things that would have been stressful were anticipated, like when I had to be gone for a week or two.

**What he wants to tell Boeing Chairman, President and CEO Jim McNerney:** Keep up your focus on leadership development. It's the stuff that I'm learning—the ways that I'm developing—that have a more direct reflection on how I perceive my happiness or engagement than anything else.

GAIL HANUSA/BOEING





# Julio Navarro

Electrophysics engineer, scientist, Engineering, Operations & Technology

*An immigrant from Argentina, with roots in New York City and Houston, Julio Navarro is a recognized expert in his field. In addition to products that have been used to enhance radio frequency technology, he has helped Boeing develop phased array antennas that are used in satellites, unmanned aircraft and missiles. His work has helped advance the field of engineering with more than 15 patents, two books and over 30 published articles. Honored in 2008 with the Hispanic in Technology Award from the Society of Hispanic Professional Engineers, Julio drives himself to perform and attributes his success to never losing sight of what's important.*

**His greatest accomplishment:** After three years with leukemia, my mother was no longer responding to her medicine and given little chance of surviving the year. Recently married, I was juggling long hours at work, completing a textbook and writing my thesis. I don't think I slept that year, but I accomplished all my projects and celebrated my graduation with my new wife, mom and family.

**How to develop:** Get involved in more things than you think you can handle and then you can surprise yourself. Our greatest opportunities happen when things are really bad—the economy, too many projects, too many bills, life in general.

**His passion:** Someone once said to find out what you love to do and you'll never have to work a day in your life. My job doesn't feel like work. I do it because I like it.

**Joining an affinity group:** As a new focal for the Society of Hispanic Professional Engineers, I work with a network of engineering mentors across the company. These mentors reach out internally to Boeing new hires and externally to future engineers. So it's a far-reaching program that has been very rewarding on a number of fronts. I am lending my technical expertise to young engineers, answering questions like, "How did you do that?" and "How long did that take?" On a broader level, the leverage effect is huge—we're building a pipeline of talent that Boeing can draw from down the road.

MARIAN LOCKHART/BOEING

# challenge



re



# Neha Gupt

Regional director for India, Middle East and Africa, Shared Services Group

*Neha Gupt is working on getting to “One Boeing.” But how do you get an international giant with legacy systems, subsidiaries and intricate compliance issues so it has one common face for our external customers? Stick with Neha long enough and you’ll find out.*

**Current project:** I am focused on “One Boeing,” which has a unique connotation outside the United States. At many international sites, there’s one person for all of Integrated Defense Systems, one for Commercial Airplanes, and one or more from Corporate, Shared Services Group and Information Technology. All of us may be in the same office, along with subsidiary partners such as Aviall. So we’re already integrated from that perspective. Internationally, “One Boeing” is about establishing common systems, processes and procedures to ensure in-country and inter-company compliance as well as to provide one face of the company to all our customers, partners, stakeholders and governments. It’s challenging.

**How mentoring shaped her career:** I’ve been lucky. I had Mary Armstrong, vice president of Environment, Health and Safety, as a mentor early in my career with Boeing. She gave me a lot of insight into the Boeing world, the United States and how things work. Even now, she is my guiding light. I go to her when I need advice or simply to share good news. Recently, I have developed a mentoring relationship with Chris Chadwick, president of Boeing Military Aircraft. His business insights have aided my professional development.

**What drives her:** Boeing is a big brand name and I’m so proud to work here. We are an admired company and brand name the world over. That is what keeps me going.

**How she balances work and life:** Life balance is tough given the challenges of working internationally. Many of my U.S. calls, for instance, are in the evening. And my region is unique because in Saudi Arabia, weekends are on Thursday and Friday. In the United Arab Emirates, weekends are Friday and Saturday. So in some ways, it feels like I’m always on call. What I try to do every now and then is take some time away from home with my loved ones and leave the computer behind. During nighttime in India, I have even put an out-of-office notice on my calendar to remind folks in other time zones that I’m sleeping!

**Where she wants to be in five years:** This is really more of a 10-year-plus goal: I aspire to represent international business, opportunities and employees on Boeing’s Executive Council.

HEMANT MEHTA/ASSOCIATED PRESS

# Analyze **this**

Boeing Debris team analyzes millions of possible debris scenarios





“There’s a certain amount of debris that is expected with each launch. Our team is very focused on the potential debris beyond what is expected.”

– Darby Cooper, integrated vehicle analysis manager

By Adam Morgan

**M**ain engine start ... 3 ... 2 ... 1 ... booster ignition ... and liftoff of Space Shuttle Endeavour. That’s what you heard if you watched November’s launch of *Endeavour* for mission STS-126. But what you probably didn’t hear or see was the work of thousands of people behind the scenes to make the launch a success. Many of those unseen elements are orchestrated by Boeing Space Exploration employees, whose jobs require careful and constant precision from start to finish.

Boeing’s Space Shuttle Debris team is one of the teams working behind the scenes to help ensure that each launch and landing goes as planned. Critical to the safety and success of each launch, the team is responsible for assessing ascent and re-entry debris—matter that may come loose from the space shuttle assembly, including ice and foam from the external tank—before these phases of flight. The team analyzes and predicts where and how hard debris might hit the shuttle (based on force, size and shape), documents the “what-ifs” for potential debris, and monitors the pieces that do separate to make sure they are within the expected size and trajectory range.

Although NASA and Boeing always assessed the potential for debris damage to the shuttle fleet, the team has been expanded and the effort intensified following the debris-related loss off Space Shuttle *Columbia* in 2003. During the return of *Columbia*, a chunk of fuel-tank insulating foam struck *Columbia*’s left wing during ascent to orbit, causing the craft’s breakup on its descent from space.

The space shuttle is one of the most complex flying machines ever built. Designed to launch like a powerful rocket, maneuver in Earth orbit like a state-of-the-art spacecraft and then land like a glider, the shuttle consists of 2.5 million parts and has a gross liftoff weight of 4.5 million pounds (2 million kilograms). This extreme machine is propelled into Earth’s orbit by 7 million pounds (31,138 kilonewtons) of thrust, accelerating to more than 17,500 miles per hour (28,164 kilometers per hour) in just 8.5 minutes. At that rate, it’s not uncommon for small pieces of debris to fall off the shuttle.

The main source of debris is the external tank—85 feet (26 meters) tall and weighing 2 million pounds (907,185 kilograms)—which is attached to the orbiter. To keep the cryogenic propellant at optimum temperatures, the tank is encased in closed-cell foam. Small pieces of this foam occasionally dislodge from the tank

**PHOTO: (LEFT)** The space shuttle accelerates to more than 17,500 miles per hour (28,164 kilometers per hour) in 8.5 minutes on its way to orbit. Boeing engineers work behind the scenes to analyze where potential debris could strike and with how much force. NASA

during the shuttle’s ascent. The extreme temperatures inside the tank lead to another source of debris: ice caused by the interaction of the cold tank and the warmer atmosphere.

“Our team is responsible for determining where debris will go once it releases from the space shuttle for both ascent and re-entry,” said Darby Cooper, an integrated vehicle analysis manager and member of the debris team. “There’s a certain



**PHOTO:** Boeing engineers in Houston use the latest in technology, including computational fluid dynamics, to analyze more than 17 terabytes of data on debris and debris trajectories that could damage the space shuttle. ELIZABETH MORRELL/BOEING

amount of debris that is expected with each launch. Our team is very focused on the potential debris beyond what is expected.”

The team works with NASA and other contractors to understand potential debris that could occur from design changes and anomalies. The Boeing team handles more than 17 terabytes of data to compute millions of potential debris trajectories and probabilistic risk assessments, integrating data from computational fluid dynamics, computer simulations, onboard cameras, sensors and various other tools to predict possible outcomes.

And the team doesn’t stop at just analyzing debris. It has achieved at least a 50 percent reduction in debris analysis cycle times—from 12 weeks down to four to six weeks on average—by eliminating rework and standardizing input and output by using software that checks for errors before running or producing data. ■

adam.k.morgan@boeing.com

# Dispatches from

## What two Boeing communicators saw in Afghanistan

In February, Integrated Defense Systems communicator Brian Nelson and Boeing Defence UK communicator Madonna Walsh journeyed to Afghanistan to capture in words and on film the experiences of allied service men and women who operate Boeing-made military equipment in one of the world's most dangerous regions.

Nelson and Walsh were guests of the United Kingdom's Joint Helicopter Command during their five-day visit to Kandahar Air Field and the British forward operating base, Camp Bastion. Both sites are major staging points in the south of Afghanistan for air and ground missions supporting coalition troops fighting the Taliban and Al Qaeda, with the ultimate aim of providing security that will encourage development, reconstruction and allow some form

of national governance to take root. They interviewed front-line military personnel from Australia, Canada, the United Kingdom and the Netherlands.

The visit allowed Nelson and Walsh to witness the critical role played in-theatre by Chinook and Apache



**PHOTO:** Group Capt. Andrew Turner commands the Joint Aviation Group in Kandahar. PATRICK ALLEN



**PHOTOS: (TOP)** C-17s transport all kinds of freight to and from Afghanistan. **BOEING (BOTTOM)** UK Chinooks airlift supplies to troops in the field.

“Seeing firsthand how these troops count on Boeing ought to make us redouble our efforts to ensure we give them the best equipment we can.”

– Brian Nelson, *Integrated Defense Systems communicator*



# Afghanistan



helicopters as well as the C-17 military transport aircraft. Members of the Royal Navy, British Army and Royal Air Force, along with servicemen from other allied nations, all of whom operate these aircraft day in and day out, shared their experiences.

Nelson and Walsh detailed what they saw and heard through reports in Boeing News Now, the company's news site on the Boeing intranet, as well as through videos recorded during the trip. The five-day account, called "Dispatches from Afghanistan," gave readers a vivid picture of the front line of the war on terror—and of the role Boeing products play in that effort. To read the account, visit <http://ids.web.boeing.com/index.aspx?com=11&id=131> on the Boeing intranet; videos can also be found there.

For Nelson and Walsh, the experience was invaluable. "Being there in person allowed me to put myself in the shoes of the troops who depend on Boeing aircraft for food, water, ammunition, medical evacuations, close air support and safe transport to and from the base," Nelson said. "Seeing firsthand how these troops count on Boeing ought to make us redouble our efforts to ensure we give them the best equipment we can."

Added Walsh: "'Dispatches from Afghanistan' enabled us to show Boeing employees worldwide what a difference they make. Every person I spoke with in Afghanistan said in so many words: 'Thank you, Boeing.'" ■

PHOTOS BY MADONNA WALSH UNLESS NOTED

**PHOTOS: (TOP LEFT)** A ground crew loads weapons onto an Apache at Camp Bastion. **AGUSTAWESTLAND (MIDDLE)** A Chinook loadmaster remains vigilant on approach to Camp Bastion. **(LEFT)** Paramedic Flt. Lt. Andy Smith relies on Chinooks to reach patients quickly. **(TOP RIGHT)** Immediate Response Team members await the next callout.

# Cut the scrap

## How the Enterprise Asset Resale organization recovers value from excess assets

By Doug Cantwell

**B**rilliant ideas sometimes have commonplace origins. Ironically, it was smoke detectors that “sparked” this one. During modification of six Next-Generation 737-700 airliners into Wedgetail Airborne Early Warning and Control platforms, mechanics on the assembly line noted they’d been removing all-but-new smoke detectors—not required for the AEW&C design—and tossing them in a scrap tub.

This was in keeping with the legacy process. The logic was to cut losses by scrapping excess material to avoid additional storage and tracking costs. But the mechanics’ recent Lean training told them there had to be a better way.

“Today, we don’t trash excess assets—or store them. We stage them for resale,” said Joe Ferreri, who manages a program called Enterprise Asset Resale (EAR). The challenge, Ferreri said, was simply to find an efficient pipeline into the resale marketplace.

The EAR program, set in motion by Integrated Defense Systems in mid-2002 to capitalize on excess inventory, has exceeded expectations. It has added more than \$25 million to program profits as well as saving \$5 million that would have been spent on scrapping, inventorying, storing and insuring unused stuff.

Those smoke detectors, for example, cost \$2,200 apiece if purchased new on the open market. The EAR team, through its strategic partner Volvo Aero Services, found a commercial airline customer that pays Boeing \$1,900 for the excess units, which carry full Federal Aviation Administration airworthiness certification and their original four-year warranty.

Program managers began to back the project when they learned that resale revenues roll directly into their IDS business units rather than flowing into some distant aggregate account. For instance, the Wedgetail AEW&C program has so far recouped \$7 million, or \$1.4 million per aircraft, from resale of components stripped from the brand-new, or “green,” airliners during modification.

“The EAR program is a great example of maximizing value for the company,” said Maureen Dougherty, AEW&C program vice president. “It generates revenue from components that would otherwise go unused, boosts our bottom line and leans out our modification process.”

EAR has acquired several more customers, including the International Tanker Program, Global Transport and Executive Services (C-40 and C-32), the C-130 Avionics Modernization Program, Airborne Laser and, most recently, the Apache helicopter and the P-8A Poseidon. The EAR tracking system helps these customers find and sell spares and tooling as well as resell components stripped from green airplanes.

### SETTING EAR IN MOTION

Once a business has identified and inventoried excess assets, it submits the information to the EAR Web site, along with suggested return values and an electronically generated manifest that certifies an asset’s flightworthiness, new or used condition, and applicable warranties. A contract and account also are established to allow electronic transfer of revenues back to the business.

An EAR inventory tracking tool provides global search capability, so Boeing businesses across the enterprise have first crack at acquiring material for their use. If there are no internal takers, the surplus is handed off to partner Volvo Aero Services



**PHOTO:** Boeing Enterprise Asset Resale Manager Joe Ferreri (left) and Phil Arroyo, Volvo Aero Services sales director, check the certification of a 737-700 tailcone, an excess asset created during modification of a new 737 into a Wedgetail Airborne Early Warning and Control platform. DOUG CANTWELL/BOEING





“Today, we don’t trash excess assets—or store them. We stage them for resale.”

— Joe Ferreri, Boeing Enterprise Asset Resale manager

for outside sale. Volvo performs a market analysis, finds interested customers and arranges terms, pending approval of the business that has consigned the material.

Once the business has made arrangements through the EAR site, Volvo sends a truck to remove the assets from Boeing facilities. This arrangement allows programs to make better use of storage areas or relinquish them altogether.

“We basically act as a sub-store or outlet for Boeing,” said Phil Arroyo, director of sales at Volvo Aero Services, “so the title doesn’t transfer on inventory until actual time of sale. But we operate on a 24/7 schedule 365 days a year, so we’re sitting on go when a customer has immediate need of a part.”

## REGULATORY ISSUES

A major concern in the resale of aircraft components is certification—maintaining it, tracking it and keeping the documentation readily available for inspection. Without certification, these parts are not legal to use.

In designing the Asset Resale Model (ARM), Ferreri incorporated user-friendly technology that tracks each component’s FAA airworthiness certificate as well as its warranty (which is still intact on components of green aircraft coming off Commercial Airplanes assembly lines). The system provides seamless tracking of airworthy assets and secure, digital “signatures” to support compliance with regulatory requirements.

Volvo brings to the table an expertise in regulatory policy, both in the international military arena and in the commercial realm. “The program would not be successful without Phil and his team, especially their knowledge of FAA regulations,” said Ferreri. “There’s nothing that will shut you down faster than regulatory issues.”

**PHOTO:** Boeing mechanics replace an engine on the company’s 767-200 training aircraft, which was on assignment with the Italian Air Force. Enterprise Asset Resale partner Volvo Aero Services took charge of reconditioning and reselling the swapped-out engine for Boeing. **VICTOR BARUZZINI/BOEING**

## STRATEGIC PARTNERING PAYS OFF

The success of EAR is a testament to the power of partnering. Ferreri and Arroyo hammered out a partnering agreement—not just a supplier arrangement—that has made the critical difference.

“The partnership we enjoy with Volvo eases administrative bottlenecks that would otherwise impede resale of excess assets,” said Val Chkautovich, supplier program manager for the International Tanker Program. “Because they have an insider’s access to our processes and policies, they’ve gained a working knowledge that allows them to streamline transactions.”

Another advantage Volvo brings to the EAR team is its global array of long-term customer relationships. In addition to its primary role of matching external customers with excess Boeing assets, the team has worked some procurement feats as well. In January, after a worldwide search, Volvo was able to locate, procure and express-ship an out-of-production Pratt & Whitney replacement engine for Boeing’s 767-200 customer training aircraft, which was on assignment with the Italian Air Force. Volvo then ran an analysis on the malfunctioning engine, determining that Boeing could recoup the most value by repairing rather than parting it out.

Pam Valdez, one of four IDS Product Support business partners and head of the EAR initiative, is pleased that ARM has attracted so many customers within Boeing and continues to gain more. “We’re happy to help other businesses replicate ARM,” she said, “so they, too, can leverage their unused assets and return that value to their programs.”

To learn more about the Asset Resale Model and how it might benefit your organization, contact Joe Ferreri at [joseph.j.ferreri@boeing.com](mailto:joseph.j.ferreri@boeing.com). ■

[doug.cantwell@boeing.com](mailto:doug.cantwell@boeing.com)

# Struttin' their stuff

Here's how Employee Involvement helped a small team excel and win new work

By Forrest Gossett

**J**im Bryant has seen improvement initiatives come—and he's seen them go—in his 30-plus years working in Boeing's KC-135 aerial refueling tanker program.

But mention employee involvement and Bryant gets passionate about the Employee Involvement (EI) team that supports the KC-135 strut program in Wichita, Kan. "It works. EI is very effective because management allows the teams doing the work to solve problems and create solutions," he said.

EI played a big part in saving the KC-135 strut program in Wichita—and quite possibly Bryant's job. In 2005, Boeing Wichita completed a program that placed new CFM56 engines on most of the nation's KC-135 fleet, with the new planes designated KC-135R models. Adding new engines to the aircraft required construction of new engine struts, the structure that attaches them to the wing.

When that contract ended, the KC-135 strut team looked for and found new work. The Air Force needed 72 engine struts for its older, Eisenhower-era KC-135E models. However, to be affordable for the Air Force, the strut program needed to streamline processes and cut production costs. Otherwise, the work would likely not stay in Wichita.

That's when Boeing Wichita implemented the EI process to make the program more efficient and economical. Terry Laird, a safety monitor, said the team dissected every aspect and step of the strut manufacturing process in order to offer the most cost-effective solution.

"In this case, we discussed our processes, how we do things, and eventually came up with a plan that worked and that met our customer's cost requirements," Bryant said. The team even designed new tooling to handle the job.

Because of the team's efforts, Boeing Wichita received the contract for the 72 struts. The team went on to start producing them ahead of schedule.

Then, in January 2007, the Air Force informed Boeing that the E-strut program order would likely be reduced from 72 struts to fewer than 30 because of budget constraints and the retirement of KC-135E-based tankers.

"The program was de-scoped, but every team member understood the importance of completing the job no matter what," said Fran Veldman, strut program manager.

"We understood the only way to get more work was to excel on our current work, so that's exactly what we did," Laird added.

Their persistence paid off when the Air Force awarded Boeing a contract to produce 12 struts of a unique configuration for special-mission KC-135s.

The strut team's commitment to on-time delivery has not wavered. In January, the team delivered a set of struts for the special-mission KC-135E a full 41 days ahead of schedule, meeting an urgent Air Force requirement. Dale Devlin, shop manager for the strut program, said accelerating the schedule was possible because of EI enhancements including improved tooling, drilling and assembly sequencing.

"I'm convinced this team can build anything," Devlin said. "It's a great group of workers." He added that the team is on the verge of progressing from an EI rating of Level 3 to the highest: Level 4.

And there's more work in the pipeline. The team will build new spare struts and engine fan ducts for the KC-135R. That aircraft is scheduled to be in service until at least 2040, providing ample opportunities to help the Air Force upgrade and maintain the fleet.

Bryant says he and his teammates are eager and ready to help keep the aircraft mission-ready. "The improvements," he said, "are all about pride. When you realize that people flying at 35,000 feet depend upon you to stay alive ... it becomes personal." ■

*forrest.s.gossett@boeing.com*



**PHOTO:** Jim Bryant, a modification mechanic, assembles an engine strut for a special-mission Boeing KC-135. BEVERLY NOWAK/BOEING



## Boeing Company – BA

NYSE: Industrials/Aerospace & Defense

As of 4/17/09

# \$38.32

### Stock snapshot

52-week range:	
52-week high	<b>\$88.29</b>
52-week low	<b>\$29.05</b>

### International competitors

EADS\* – EAD.PA

As of 4/17/09	<b>€10.28</b>
52-week range:	
52-week high	<b>€17.45</b>
52-week low	<b>€8.12</b>

*\*prices in Euros*

### U.S. stock indexes

S&P 500

As of 4/17/09	<b>251.02</b>
52-week range:	
52-week high	<b>441.96</b>
52-week low	<b>194.13</b>

S&P 500 Aerospace and Defense Index

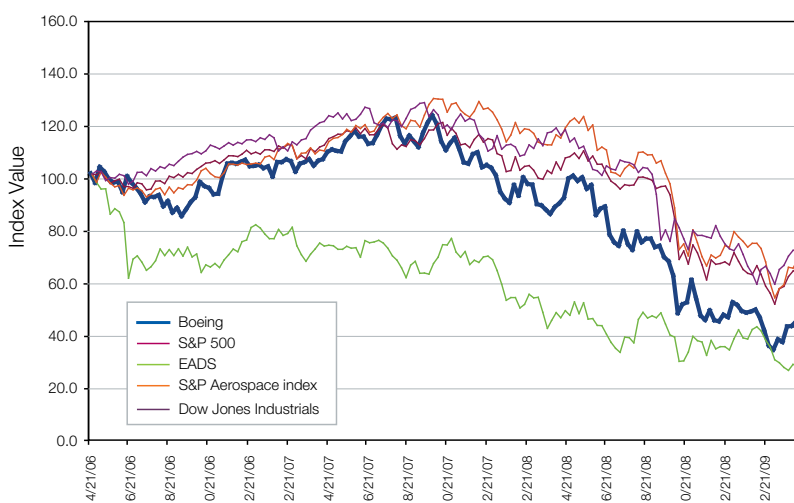
As of 4/17/09	<b>869.60</b>
52-week range:	
52-week high	<b>1,440.24</b>
52-week low	<b>666.79</b>

Dow Jones Industrials

As of 4/17/09	<b>8,131.33</b>
52-week range:	
52-week high	<b>13,191.50</b>
52-week low	<b>6,440.08</b>

### Stock price chart

The chart below shows the stock price of Boeing compared with other aerospace companies, the S&P 500 index, the S&P 500 Aerospace and Defense Index, and the Dow Jones Industrials. Prices/values are plotted as an index number. The base date for these prices/values is April 21, 2006, which generates three years of data. The prices/values on that date equal 100. In other words, an index of 120 represents a 20 percent improvement over the price/value on the base date. Each data point represents the end of a trading week.



### Boeing stock, ShareValue Trust performance

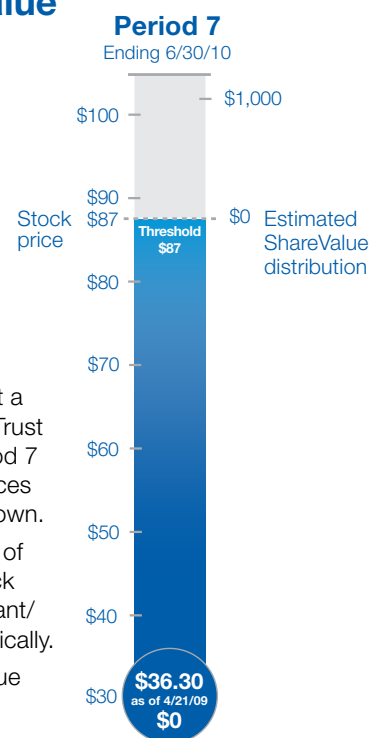
Sharevalue Trust is an employee incentive plan that allows eligible employees to share in the results of their efforts to increase shareholder value over the long term.

The program—which runs for 14 years and ends in 2010—features seven overlapping investment periods. The program is currently in Period 7.

This graph shows an estimate of what a “full 4-year participation” ShareValue Trust distribution (pretax) would be for Period 7 if the end-of-period average share prices were the same as the recent price shown.

The share price shown is the average of the day’s high and low New York Stock Exchange prices. Updates to participant/employment data will be made periodically.

For more information on the ShareValue Trust, visit [www.boeing.com/share](http://www.boeing.com/share).



## **IN MEMORIAM:** The Boeing Company offers condolences to the families and friends of the following employees.

- Freddie Arnett**, manufacturing technician; service date Aug. 17, 2007; died March 11
- Claudia Banker**, business and planning analyst; service date July 27, 1987; died April 10
- Ralph Braeuler**, software engineer; service date Jan. 20, 1998; died April 1
- George Bryson**, system support technician; service date Oct. 3, 1988; died March 20
- Leonard Capps**, system engineering support analyst; service date March 1, 1989; died March 25
- Adam Catt**, assembler, wire group; service date Aug. 22, 2008; died March 31
- Philip Cayton**, structural analysis engineer; service date March 26, 2004; died March 25
- Johannes Chel**, fire protection operations specialist; service date March 26, 1979; died April 10
- Don Enriques**, aircraft structure mechanic; service date July 19, 1983; died March 18
- Thomas Erault**, government property management specialist; service date Sept. 7, 1982; died March 13
- Harold Klaus Jr.**, guidance, navigation and control engineer; service date March 14, 1976; died March 25
- Christopher Lemay**, infrastructure generalist; service date May 23, 1978; died March 19
- Ravi Malla**, structural analysis engineer; service date Dec. 3, 2005; died April 10
- Beverly Pauley**, procurement analyst; service date July 3, 1961; died March 14
- Larry Pratt**, production material coordinator; service date Sept. 26, 1966; died April 2
- Robert Reimer II**, procurement agent; service date July 16, 1973; died March 18
- David Sanders**, design and analysis engineer; service date March 17, 1997; died April 9
- Kathryn Smith**, factory consumables handler; service date March 18, 1987; died April 8
- Simone Taylor**, fabrication inspector; service date June 12, 1995; died April 7
- William Texidor**, electronics maintenance technician; service date Nov. 26, 2007; died March 24
- Mai Bach Ton**, senior radio frequency technician; service date June 4, 1983; died April 7
- Douglas Vannoy**, general assembler/installer; service date Jan. 22, 1979; died March 9





## FAREWELL TO THE '400'

In a ceremony last month in the Everett, Wash., factory, Boeing employees, retirees, customers and suppliers gathered to honor the last 747-400 built, a 747-400 Extended Range Freighter. Production continues on the newest 747, the 747-8, which is scheduled to enter into service in the third quarter of 2010.

"Today is a special day in the 747 Program's storied history," said Mo Yahyavi, vice president and general manager of the 747 Program. "For more than 20 years, the 747-400 has been a way of life for many of us here at the Everett site." In that time, the 747-400s in service have conducted more than 5 million flights and carried passengers and cargo approximately 17 billion nautical miles (19.5 billion miles, or 31.5 billion kilometers), the equivalent of flying around the world 221,061 times.

## HUNTSVILLE AND ST. LOUIS TO CONDUCT RECYCLING EVENTS

Boeing facilities in the St. Louis area and in Huntsville, Ala., will conduct recycling events in early June for electronics such as old TVs, cell phones, and computer monitors and hard drives.

In St. Louis, the Boeing Employees for Environmental Protection (BEEP) club, in partnership with local organization Web Innovations and Technology Services (WITS), will hold its second of three annual recyclable electronics collections on June 4.

For more information about this event and to learn more about BEEP, visit <http://beep.stl.mo.boeing.com> on the Boeing intranet. For more about WITS, visit [www.witsinc.org](http://www.witsinc.org).

The Huntsville Green Team, in partnership with the Solid Waste Disposal Authority of the City of Huntsville, will conduct a Household Hazardous Waste Turn-In Day on June 5. For more information about Huntsville's Environment, Health and Safety actions, including Green Team activities, visit <http://huntsville.web.boeing.com/ehs> on the Boeing intranet.

## BOEING WINS 'GREEN CABIN' AWARD

A Boeing- and supplier-developed concept for recyclable airplane carpet won the Greener Cabin, Health and Safety category of the Crystal Cabin Awards last month at the Aircraft Interiors Expo in

**PHOTO:** Employees, customers, suppliers and guests attended a ceremony last month to honor the 747-400 family.

GAIL HANUSA/BOEING

Hamburg. Co-developed by TheConceptCenter, part of Boeing Commercial Airplanes Product Development, and InterfaceFLOR, the carpet tiles are 100 percent recyclable and come in standard sizes, which eliminates cutting, edge finishing and taping processes required with conventional carpet rolls. Product testing and supplier qualification continue this year.

## EMPLOYEES DONATE TO MEET GLOBAL COMMUNITY NEEDS

Boeing will match the first \$50,000 (U.S.) of employee donations to the Red Cross to support relief efforts in Central Italy following last month's earthquake. Retiree donations will be matched at \$0.50 per dollar. Boeing employees, retirees and international locally hired employees can contribute via "My Community Giving" on TotalAccess (on the Boeing intranet or through MyBoeingExpress); those without TotalAccess can contribute using a personal credit card at [www.cybergrants.com/pls/cybergrants/eg\\_login.login?x\\_gm\\_id=1292](http://www.cybergrants.com/pls/cybergrants/eg_login.login?x_gm_id=1292) on the Internet.

Last year, Boeing employees contributed \$31 million to fund food banks, disaster relief and other human-services programs through the Employees Community Fund. Employees can make tax-deductible charitable donations via ECF pooled funds, from which employee-elected boards and committees distribute grants to support local nonprofit efforts. They can also contribute to eligible groups through designated giving.

"Most members feel they can drive more positive changes in their communities through ECF pooled funds than they could on their own," said Patrice Mingo, director of Strategic Programs for Global Corporate Citizenship. "Not only are the power of individual contributions multiplied, but having local committees vet and approve grants helps ensure that funds go to worthy efforts that make a real difference in people's lives."

May marks the traditional fundraising season for ECFs, but employees can sign up anytime through TotalAccess.

# Boeing Defence Australia's F/A-18 Technical Publications team

Our Boeing Defence Australia F/A-18 Technical Publications team is part of the Technical Data Services organization in Global Services & Support, Australia. Our 12 employees are located at three sites around Australia—Brisbane and Amberley in Queensland, and Williamtown, north of Sydney, in New South Wales. Since 2005, we have been updating and maintaining F/A-18 Hornet aircraft maintenance and aircrew manuals for the Tactical Fighter Systems Program Office, part of the Australian Department of Defence.

We're very proud of our track record of producing and maintaining high-quality publications. Over the years, we have continually improved and streamlined our processes and met and exceeded many of our performance metrics. Indeed, over the past four years we have achieved a zero percent error rate across our F/A-18 maintenance publications.

One secret to our success is the strong relationship we have with our customer. Bob Keppie is Boeing Defence Australia's F/A-18 technical data coordinator and is based in Williamtown, where Royal Australian Air Force technicians use the manuals each day. With a direct line to the customer, Bob can quickly find out any information we need, making the job of maintaining F/A-18 publications a whole lot easier.

Our team's performance and customer commitment were recognized in February 2008. At the time, we were contracted to produce F/A-18 maintenance manuals only. Confident that we could expand our core capability, the customer approached us to produce two additional F/A-18 publications—a flight manual and flight manual checklist.

The publications were unique when compared with the work we had done previously. The flight checklist was especially challenging to produce because it was in a different format and for a new audience—aircrew instead of technicians. It was also physically smaller than what we were used to; yet there was an enormous amount of data to include.

We overcame these challenges to produce both deliverables within an extremely tight time frame, delivering the final products to the customer in September 2008. Since the publications were delivered, they have not needed updating. The customer is satisfied with the quality and considers the information in each one to be stable.



**PHOTO:** Boeing Defence Australia's F/A-18 Technical Publications team: Clay Beldon (standing, from left), Karen Lee, Bob Keppie, Doug Footit, Steven Anderson, Ian Williamson. Seated, from left: Peter Bailey, David Jaillet, Philip Entwhistle, Ian Jay Walters and Cameron Blight. ALARIC WILLI

It is the ultimate compliment when a customer trusts you enough to realize you're capable of producing materials that are out of your usual scope. As a team, we're proud to have contributed to Boeing's profitability and to broadening the capability of the team for the future. ■





## THERE IS STRENGTH IN NUMBERS.

Boeing employees combine their charitable contributions to form the largest fund of its kind in the world, the Employees Community Fund of The Boeing Company. It's just another example of how Boeing people, working together, can do amazing things.

 **BOEING**

*Global corporate citizenship refers to the work Boeing does—both as a company and through its employees—to improve the world. This ad reflects Boeing's support of the Employees Community Fund which enables employees to make charitable donations that drive positive change in their communities.*

No ECF contributions were used to produce this material. All awareness campaign costs are paid by The Boeing Company.



# C-17



## MODEL PROGRAM: ON COST, ON SCHEDULE.

The C-17 Globemaster III is the world's most capable airlifter and a model program by any standard. On cost and on schedule for more than a decade, the C-17 is also a benchmark of quality, innovation, reliability and readiness — winner of both the Collier Trophy for aeronautic excellence and the Malcolm Baldrige National Quality Award. Perhaps most important, the C-17 is an invaluable asset to our warfighters, flying more than 80% of all strategic airlift missions and delivering more than 50% of all airlift cargo. A model of excellence by any criteria.

 **BOEING**

*This new Integrated Defense Systems print ad showcases the C-17 Globemaster III as a model acquisition program. The ad will run in The Washington Post and key congressional trade publications.*