

Committee Corner

News from ALPA's Committees

Flight Deck of the Future

ALPA pilots work hand-in-hand with Boeing on Dreamliner design.

"One of the reasons that the 777 is a world-class airplane is the involvement, knowledge, and experience of pilots like you," said Mike Bair, Boeing's B-787 program manager and vice-president, to representatives of ALPA, the International Federation of Air Line Pilots Associations, Boeing, and its suppliers at the August 31 B-787 flight deck unveiling. "There's no question that Boeing wanted that same advantage for the 787." [See "As We Go to Press," October.]

ALPA's president, Capt. Duane Woerth, invited on behalf of Association members to attend the Seattle, Wash., event, led a delegation that included ALPA's aviation safety leaders and staff, its Human Performance and National Security Committees, and pilots from Northwest Airlines and Continental, the first two U.S. ALPA carriers that have committed to purchase the airplane.

The basics

Boeing will manufacture the B-787 in three models: the B-787-8 (223 passengers for 8,500 nm), the B-787-3 (296 pas-



The B-787's "pilot-centered" flight deck was developed with significant input from ALPA pilots.

sengers for 3,500 nm), and the B-787-9 (259 passengers for 8,300 nm). Major assembly of the B-787 will begin in 2006, with first flight in 2007, and first delivery in 2008.

Designed to replace the B-767, this new airplane will have a fuselage diameter 14 inches wider than that of other comparable airplanes, providing increased passenger comfort at shoulder level. It is designed to cruise at Mach 0.85, with the range capability to connect more than 450 new city pairs.

Boeing maintains that the shift from an energy management system based on bleed air to an all-electric ar-

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chitecture will require as much as 35 percent less power from the engines.

Operating cabin altitude in the B-787 will be maintained at 6,000 feet, boosting comfort for passengers, pilots, and cabin crew. During development, Boeing conducted altitude chamber studies, which found that passengers began to feel significantly fatigued on long-range flights with cabin altitude above 6,000 feet. A carbon-fiber fuselage adds both strength and durability, making it possible to maintain the 6,000-foot operating cabin altitude.

Composites pulling their weight

The B-787 will be made up of 50 percent composites and 20 percent aluminum by weight, as opposed to the B-777, which is 12 percent composites and 50 percent aluminum. The B-787 is expected to weigh between 30,000 and 40,000 pounds less than a comparable aluminum airplane, helping to make the aircraft about 20 percent more fuel-efficient.

Capt. Woerth asked Boeing engineers how the carbon fiber would stand up to inadvertent hits from ground equipment. "Carbon fiber is very stiff and does not dent like aluminum, and it has exceptional impact resistance," said Mike Carriker, chief pilot for the B-787 program at Boeing. "However, if the material is breached, the key point is that the fibers in the material provide multiple load paths so that cracks do not form."

Boeing has developed techniques for repairing damaged composite structures that range from using simple epoxy to installing more-complex riveted-titanium patches. Through improved structural and systems design, the manufacturer anticipates a 30 percent maintenance savings for the B-787 over similar airplanes.

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Pilot-centered flight deck

The B-787 flight deck will be equipped with dual head-up displays (HUDs). Required navigation performance (RNP) of 0.1 will allow approaches to minimums nearly as low as Category I. GPS landing system (GLS) approaches can be flown to Cat I minimums, with future growth to autoland. The HUD will not be certified as a primary flight display, but can be used throughout the entire flight environment.

SATCOM, autoscans weather radar, and a full-time tactical map will also be standard. Map range will extend to 1,280 nm, which means that during ETOPS flights certified to 330 minutes, the most distant ETOPS alternates can always be displayed. Boeing has proposed that experienced ETOPS operators be permitted to use an ETOPS limit of 180 minutes initially and move to as much as 330 minutes after 24 months.

The B-787 cockpit has five liquid crystal displays (LCDs), providing twice the pixel space of other flight decks. The flight crew will always have a 20-nm (3 minutes flying time) tactical map available for situational awareness. The LCD information is placed for intuitive access. The primary flight display (PFD), with altitude and airspeed scales, occupies most of the outboard screen on each side, with auxiliary information along each outboard edge, and the tactical navigation display at the bottom. The actual horizon line extends through the PFD, providing a much larger reference. Most menu items on the displays may be selected in one of three ways: dedicated button, selector dial or “tabber,” and scratch pad cursor. The cursor will move through the console display to the nearest panel display by continuous movement from the scratch pad. If the crew makes an incorrect input to the flight management system, the system provides possible explanations for the error instead of simply rejecting the input.

Not your average avionics

The Dreamliner avionics are integrated with a common-core computing capability, which, in combination with the large LCDs, allows for the number of line replaceable units to be reduced from 22 in the B-777 to 12 in the B-787. As a result, systems such as the transponder can be controlled through software and accessed on screen. Upgrades can be performed largely through software changes, rather than having to replace hardware.

Boeing has built in the capability to display airport features at a display range of ½ nm. The manufacturer believes that the FAA will require a system similar to TCAS in the future to avoid ground collisions, and the ½ nm display range will accommodate that potential requirement.

The B-787 flight control laws will be similar to those of the B-777. Differences include a full-time thrust-asymmetry compensation system and rate command, rather than proportional control, in the roll axis. The B-787 control wheel will be ergonomically different from that of the B-777, but the forces, displacements, and response will be

similar. The flight control system will incorporate hydraulic fuses to protect against hydraulic failures, and the airplane will have one electric flight control actuator in each wing for redundancy.

Boeing has reviewed past airline accidents and has made design decisions to try to prevent similar accidents in the future. Yet, the decisions are not always obvious. For example, advances in wheels and brakes would have provided the B-787 with excellent runway performance without thrust reversers. Eliminating them would have reduced both weight and complexity. However, Boeing’s research indicated that reversers have prevented accidents in some cases, so the manufacturer retained the reversers in the B-787 design to enhance safety.

ALPA involved every step of the way. ALPA’s B-787 Project Team, as part of the ALPA Air Safety Structure, has worked closely with Boeing’s team throughout the development of the B-787 and will continue this partnership as the Dreamliner goes into production and operation.

ALPA’s Boeing Aircraft Development Project Team includes me, Capt. Terry Lutz, team leader; Capt. Joe Kohler (Northwest), co-leader; Capts. Steve Luckey (Northwest, Ret.), John Prater (Continental), and Skip Slyfield (Delta); and First Officers Dave McKenney (United) and Dave Hayes (Northwest).

“This flight deck is proof-positive that the earlier pilots are involved in the design phase, the greater the opportunity to improve safety, security, and efficiency,” concludes ALPA Executive Air Safety Chairman, Capt. Terry McVenes (US Airways).—*Capt. Terry Lutz (Northwest), ALPA’s Boeing Aircraft Development Project Team Leader*

Preventing Runway Incursions: No Longer Hit or Miss

One foggy evening in December 1999, the flight crew of US Airways Flight 2998, a B-737, was preparing for takeoff from T.F. Green Airport in Providence, R.I. Capt. Randall Tilly, who now flies as a first officer, and First Officer Perry Redmond contacted the tower as they approached Runway 5R. Because of the restricted visibility, the tower controller, who was working both ground and local control, had to rely on pilot reports to track aircraft positions.

As Capt. Tilly and F/O Redmond were holding short of the runway and waiting for takeoff clearance, the pilots of a B-757 radioed that they were unsure of their own position. “We couldn’t see more than a few yards ourselves,” says Capt. Tilly. “From what we heard on the radio, we were not convinced that the 757 crew knew where

they were.” The B-757 crew had taken a wrong turn while trying to taxi to the gate. The tower controller, the B-737 flight crew, and the pilots of other aircraft on the airport could not locate the B-757 in the thick fog.

In spite of the confusion, the tower controller cleared Flight 2998 for takeoff on Runway 5R. Capt. Tilly and F/O Redmond refused to move their aircraft until the B-757 had arrived at its gate. The clear-thinking B-737 pilots had avoided potential disaster, because the disoriented B-757 flight crew had returned to Runway 5R.

While the Flight 2998 event is just one example, ALPA’s aviation safety team is working to eliminate *all* runway incursions. As part of ALPA’s efforts, it recently unveiled a new Internet-based interactive tool to help pilots learn to do their part to prevent these rare, but serious, events.

Runway incursions occur when an aircraft, vehicle, or person on the ground creates a collision hazard or loss of separation with an aircraft taking off or landing. According to the FAA, more than 225 runway incursions occurred at towered airports in the United States between January and August 2005. While most of these incursions involved general aviation aircraft, airline pilots are not immune to the risk factors. Low visibility, night flying, complex airport operations, poorly designed airport geometry, and cockpit distractions can all set the stage for an incursion.

ALPA’s new Runway Safety website is an online continuing education program designed to help pilots learn to safeguard against collisions and loss of separation, to recognize the runway incursion warning signs, and to respond

effectively. The Runway Safety website, located at www.alpa.org/runwaysafety, is the result of a partnership involving ALPA, the FAA Office of Runway Safety and Operational Services, the Aircraft Owners and Pilots Association, and the AOPA Air Safety Foundation.

“Each pilot favors a particular type of cue, such as signs or markings, to establish his or her situational awareness,” continues Capt. Tilly. “One of the many benefits of ALPA’s Runway Safety program is that it helps pilots to identify

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which cues they favor, so that they can become aware of other cues to use when those they usually rely on aren’t available.”

Individual website sections, which cover causes, marking and signage, situational awareness, cockpit management, and new technology, contain vivid descriptions of the latest research and case studies of actual events. Interactive activities help pilots learn about the runway incursion risk factors and the best practices for responding.

“Our new web-based training, when used to supplement FAA-mandated company training, provides pilots with a powerful tool for avoiding runway incursions, but it’s not the whole solution,” says Capt. Mitchell Serber (Comair), chairman of ALPA’s Airport Ground Environ-



Capt. Rory Kay (United), ALPA Executive Air Safety Vice-Chairman, (above) is among the presenters featured in the new Runway Safety online continuing education tool designed to help pilots reduce runway incursions. The tool is found on ALPA’s Runway Safety website (left), the result of a partnership involving ALPA, FAA’s Office of Runway Safety and Operational Services, the Aircraft Owners and Pilots Association, and the AOPA Air Safety Foundation.

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ment Group. "Improving airport signage and markings, adding runway status lights, and capitalizing on new technology to monitor traffic in the air and on the ground are also necessary."

While ALPA is leading industry efforts, congressional action to position the FAA to meet the runway incursion challenge is also essential. "With air traffic increasing every day, the risk that runway incursions pose to passengers, crews, and cargo will only grow more serious," concludes Capt. Serber. "Through this new program, ALPA is helping pilots to do their part to eliminate runway incursions, but we need Congress to provide the FAA with the funding to make new technology available, and airport authorities need to improve operations as well."

ALPA would like to thank AOPA and the AOPA Air Safety Foundation staff for their assistance in producing this interactive website for airline pilots. Air Safety Foundation Executive Director Bruce Landsberg and staff members David Wright and Brian Peterson supported ALPA and the FAA Office of Runway Safety and Operational Services in producing this program to improve airline pilot knowledge and situational awareness. Immersion Interactive, a Frederick, Md., design and marketing company, also supported the project. A similar website for general aviation pilots is available on the AOPA Air Safety Foundation website (www.aopa.org/asf).

ALPA Tackles Fatigue

ALPA's president, Capt. Duane Woerth, recently created a Pilot Fatigue Task Force, chaired by Capt. Chris Beebe,

ALPA vice-president-finance/treasurer, to assess members' concerns about pilot fatigue, evaluate solutions, and begin to advance them.

Economic hardships in the airline industry are forcing airlines to do more with less. Understaffing and higher utilization requirements are forcing pilots to work more days per month, adding stress, diminishing quality of life, and creating fatigue—potentially leading to unsafe flying.

This matter was discussed in depth at the ALPA Flight Time/Duty Time and Scheduling Seminar, held near Washington Dulles International Airport October 17–18. Pilots' experiences shared at this forum made clear that fatigue is a problem that needs to be addressed, especially at regional carriers whose pilot flight schedules are reducing the margin of safety.

Speaking at the Executive Board meeting in Herndon, Va., on October 25, Capt. Woerth announced that the Fatigue Task Force is working on an online survey that will be available to all members as early as December 1.

This information-gathering tool will enable the Task Force to measure specific concerns and learn more about pilots' priorities. Participating pilots will have the opportunity to voice their opinions about a variety of fatigue-related issues ranging from how often they fly fatigued to possible solutions for curbing this problem.

Look for more information about the Pilot Fatigue Task Force and this important issue in *Air Line Pilot*, on Crewroom.alpa.org, and in *FastRead* in coming months.

ALPA Restructures National Security Committee, Adds Two New Security Groups

ALPA's newly restructured National Security Committee, led by the NSC chairman, Capt. Bob Hesselbein (Northwest), met October 11–13 at the Association's offices in Herndon, Va. Separate meetings of two new ALPA security groups—the ALPA Security Council and the ALPA National Security Steering and Oversight Committee (NSSOC)—also took place during the 3 days.

The Security Council is made up of all of the MEC Se-



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Economic hardships in the airline industry are forcing airlines to do more with less. Understaffing



Working lunch: Capt. Bob Hesselbein (Northwest), ALPA National Security Committee chairman (left), talks shop with Capt. Kevin Bailey, Atlantic Southeast MEC Security Coordinator (center), and F/O Scott Graham, United MEC Security Committee vice-chairman and NSC Law Enforcement Liaison Project Team leader.

curity Coordinators plus the National Security Committee Director of Operations, First Officer Todd O'Brien (Piedmont). The Security Council members elected Capt. Tom Walsh (Delta) from their ranks to chair the group.

The NSSOC includes all of the members of the National Security Committee, along with Capt. Dennis Dolan (Delta), ALPA's first vice-president, and Capt. David Webb, FedEx MEC chairman. The mission of the NSSOC is to ensure that the National Security Committee is properly supporting ALPA members and is accomplishing the goals set forth by the National Security Committee and the guidance provided by the Security Council.

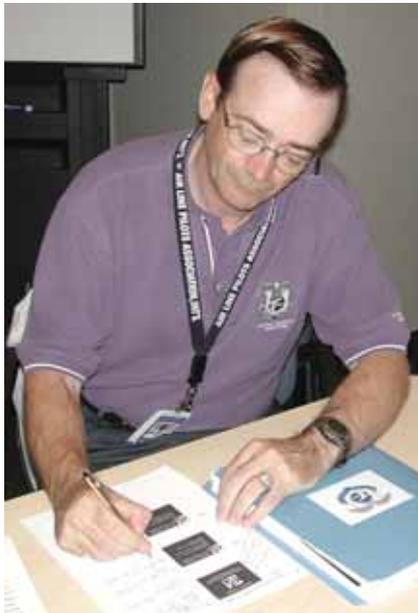
The National Security Committee meeting opened with reviews of the new structure and reports from National

Security Committee members on current projects and goals. National Security Committee members also previewed a new National Security Committee website. The preview included a feedback session to ensure that their

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input is made to this new product to support ALPA's security efforts.

Be on the lookout for the release of the new National Security Committee website—designed to greatly enhance ALPA members' security awareness and knowledge—in the coming weeks. 🌐



PHOTOS: JAN W. STEENBLIK



Taking notes, above, are (left to right) Capt. Tom Walsh, Delta MEC Security Coordinator and newly elected ALPA Security Council chairman; F/O Craig Hall (Air Canada Jazz), ALPA National Security Committee director, Canada; and F/O Bill McReynolds (FedEx), ALPA National Security Committee vice-chairman and ALPA President's Committee for Cargo chairman. At left, F/O Rohn Newman, Delta MEC Security Committee member, listens as F/O Wolfgang Koch, Northwest MEC interim Security Coordinator, discusses an issue and Capt. Clyde Romero (US Airways), ALPA National Security Committee director of information and communications, types notes.