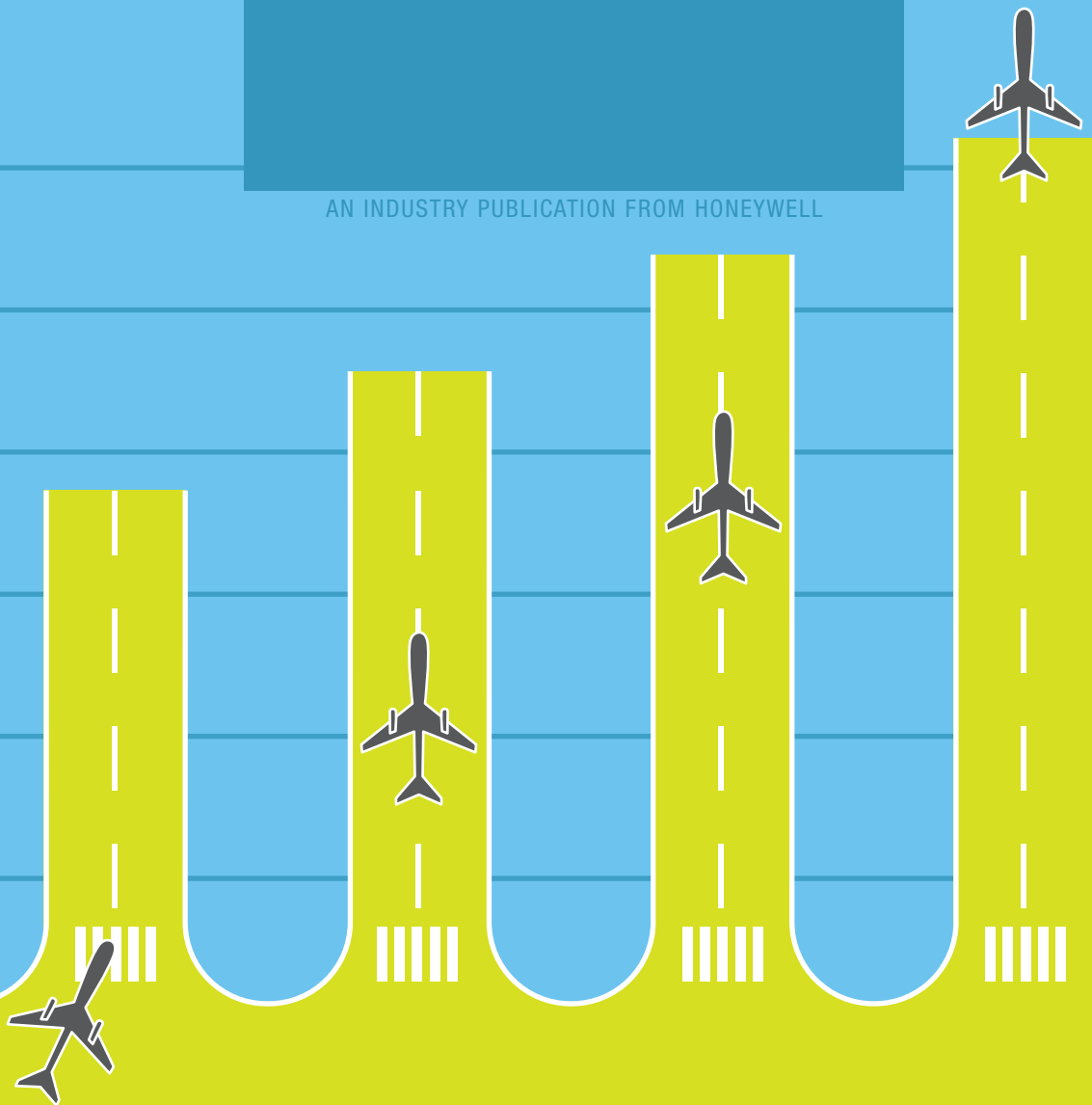


into the BLUE

Q3.09

AN INDUSTRY PUBLICATION FROM HONEYWELL

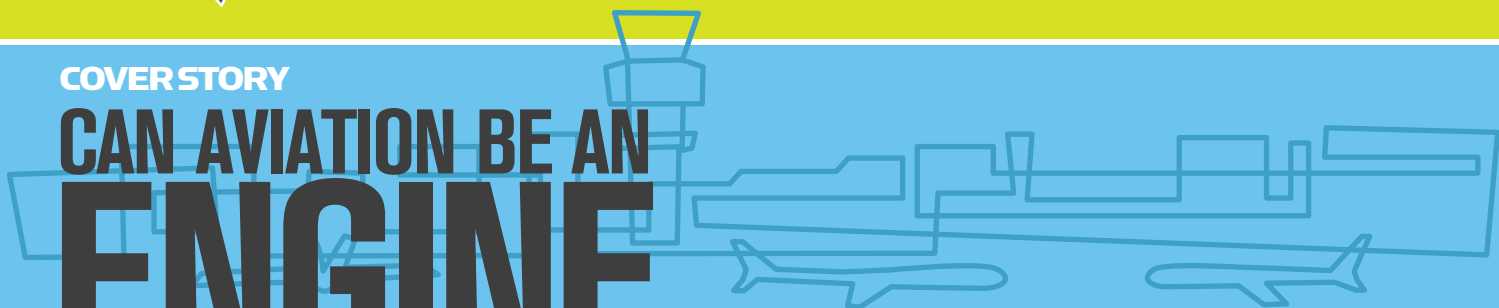


COVER STORY

CAN AVIATION BE AN

ENGINE

THAT DRIVES ECONOMIC RECOVERY?



Into the Blue

An industry publication from Honeywell

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While the information published in *Into the Blue* magazine is intended to be as accurate as possible, it is provided for informational purposes only and no material presented herein should be considered as, or is a substitute for, specific technical, regulatory, or legal advice. All airline personnel are advised that their company's policies might differ from or conflict with information included in this publication.

Many industry sources were consulted for the statistical references included in this publication, including the Air Transport Association, the International Air Transport Association and Forrester Research. For specific source information regarding article information, please contact us at atr@honeywell.com.

Into the Blue Magazine –3rd Quarter, 2009

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PREFLIGHT



Welcome aboard for another issue of *Into the Blue*, the preeminent airline industry resource for airline executives. At *Into the Blue*, we are focused on providing you key industry information to help improve your daily operations while maximizing aircraft performance and offering unique insights about Honeywell products and services you may already own or use.

WEATHERING ECONOMICALLY CHALLENGING TIMES

A global financial crisis, unpredictable fuel prices and an aviation industry facing restructuring – these are all topics on the agendas of airline executives right now. The numbers tell a pretty powerful story. The International Air Transport Association (IATA) recently revised its forecast for the industry, and for 2009, it said it now expects an aggregate industry loss of US\$9 billion, up from the loss of US\$4.7 billion that it originally forecasted in March. The domestic U.S. industry has been one of the hardest hit by this crisis. According to OAG Aviation, the latest round of capacity cuts expected to take effect this fall will reduce the number of seats on domestic flights to 66.5 million, down from a peak of about 84 million in 2001 and the lowest since 1984.

Today's situation is unprecedented and is, no doubt, the most difficult ever encountered by our industry. For all of us, it is a matter of survival. Airlines are continuing to do everything possible to weather the downturn – revising their route structures, eliminating or reducing unnecessary costs, parking or retiring less efficient aircraft and implementing ancillary revenue strategies. For our part, Honeywell is focused on partnering with our customers to make sure we are investing in the right technologies for the future while executing on current program commitments. This ensures that we are able to deploy the products and services our customers need to operate safely and efficiently.

We are part of a resilient industry. Progress on new technologies, efficiencies and flexibility will help all of us survive this crisis and emerge from these difficult times better positioned to serve our customers and succeed financially. As an industry, we must work together to adjust strategically and decisively. Our response will determine how quickly we return to growth, and how effectively we are able to deal with future downturns.

In this issue, we will take a closer look at how aviation is facing the current challenges and how our industry can serve as a catalyst for recovery and growth in the future. Thank you for joining us as we prepare to take off for another issue of *Into the Blue*.

John Bolton
President
Air Transport & Regional
Honeywell Aerospace

Have a comment you would like to share about *Into the Blue*? Please email us at atr@honeywell.com.

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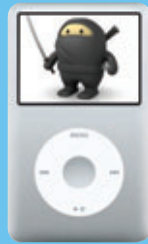
COVER STORY

CAN AVIATION BE AN ENGINE THAT DRIVES ECONOMIC RECOVERY?

The global economic slowdown has taken its toll on the airline industry. How are airlines facing the current challenges and can aviation serve as a catalyst for recovery and growth in the future? [page 6](#)

CROSS-CHECK

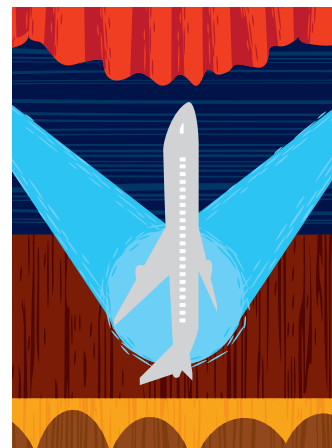
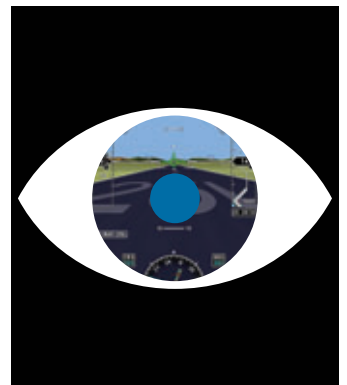
Get the facts straight as we explore key information from across the airline industry, including a new company that is providing air travelers with a way to travel baggage-free, the FAA's plan to retool the rules for keeping flight crews trained and refreshed, and how mobile gadgets may threaten the future of in-flight entertainment. [page 4](#)



HORIZONS

Future Vision: the Flight Display of the Future

Flight displays have come a long way from the one-line monochrome text of the GPS displays of the early 1990s. Learn how synthetic vision is providing pilots with a better view to enhance safety and efficiency. [page 11](#)



FEATURE

The Role of Regionals

Regional jets have become an essential part of the global fleet, but even regionals are not immune to the global economic slowdown. How are regional aircraft weathering the storm and how will they ride out the downturn? [page 13](#)



PERSPECTIVES

Your resource for the latest information from Honeywell regarding field issue resolutions, technology, company news and more. Read on to learn more about the Airbus A380's historic landing at the Oshkosh EAA AirVenture show, an update on Honeywell's Customer & Product Support organization and the launch of Honeywell's new seven-inch touchscreen handheld GPS product, the Bendix/King AV80R™ ACE. [page 16](#)

DEPARTURES

From a new NASA project aimed at developing quieter aircraft to Air New Zealand's new bare essentials airline safety video – it is all in this quarter's convergence of the unique and interesting. And, before you take off, be sure to also check out the upcoming airline calendar to see where the key players in the industry will be. [page 18](#)

757 HAS NEAR MISS WITH LAWNMOWER

A plane carrying almost 200 passengers had a close shave with a tractor lawnmower as it landed on a foggy night in late May of this year. The aircraft, which had flown from Sharm el-Sheikh in Egypt, had 198 passengers and eight crew on board. No one was injured. The driver of the sit-on mower did not even notice the Boeing 757 until its wing passed over his head as he cut grass near runways at the Dublin Airport. The mower had no rear lighting or flashing beacon and it was not equipped with any air band radio equipment capable of listening in on the control tower frequency. Several ride-on mowers had been cutting grass on the side of runways until work had been stopped six minutes earlier due to fog. Air traffic controllers were not aware the unsuspecting workman was almost in the path of the oncoming jet when they gave the all clear for landing.



Woman Buys Out Business Class to Sit with her Pooch

Unwilling to fly without her pooch by her side, an Israeli woman recently purchased the entire business section of a Paris-to-Tel Aviv flight. The woman said she could not bear the thought of her eight-year-old Boxer dog being placed in a cage in the cargo hold of the plane for the duration of the flight so she paid US\$32,000 to ensure the dog would be able to travel next to her for the entire flight.



PASSENGER FIXES BROKEN PLANE, AVOIDS DELAY

An aircraft engineer helped air travelers avoid a long delay when he fixed the plane on which he was a passenger. The man was onboard a Thomas Cook flight from Menorca, Spain to Glasgow, UK, when the captain announced that the flight was delayed because of a technical issue. He told passengers that an engineer would probably have to be flown out to fix the problem, which could take up to eight hours. The passenger told cabin staff that he was a qualified engineer and offered to help. He managed to resolve the problem and the plane took off, landing in Glasgow just 35 minutes late. A Thomas Cook spokeswoman said that the company followed procedures to check the man's license and ensure he was qualified before allowing him to work on the Boeing 757-200.



NEW ZERO BAGGAGE SERVICE GIVES NEW MEANING TO TRAVELING LIGHT

Zero Baggage, a new company being launched this fall by a Canadian entrepreneur, promises to provide air travelers with an "environmentally responsible, anxiety-free way of living and traveling." How? By renting clothing. Travelers select the clothes they need to rent – either pre-worn or, for more money, brand new – and Zero Baggage delivers them upon arrival. The items are returned when no longer needed. Travelers avoid waiting in queues to check luggage, worrying about bags being lost or stolen, lugging around heavy baggage and paying checked luggage fees.

FAA Seeks Retooling of Rules to Keep Flight Crews Trained, Refreshed

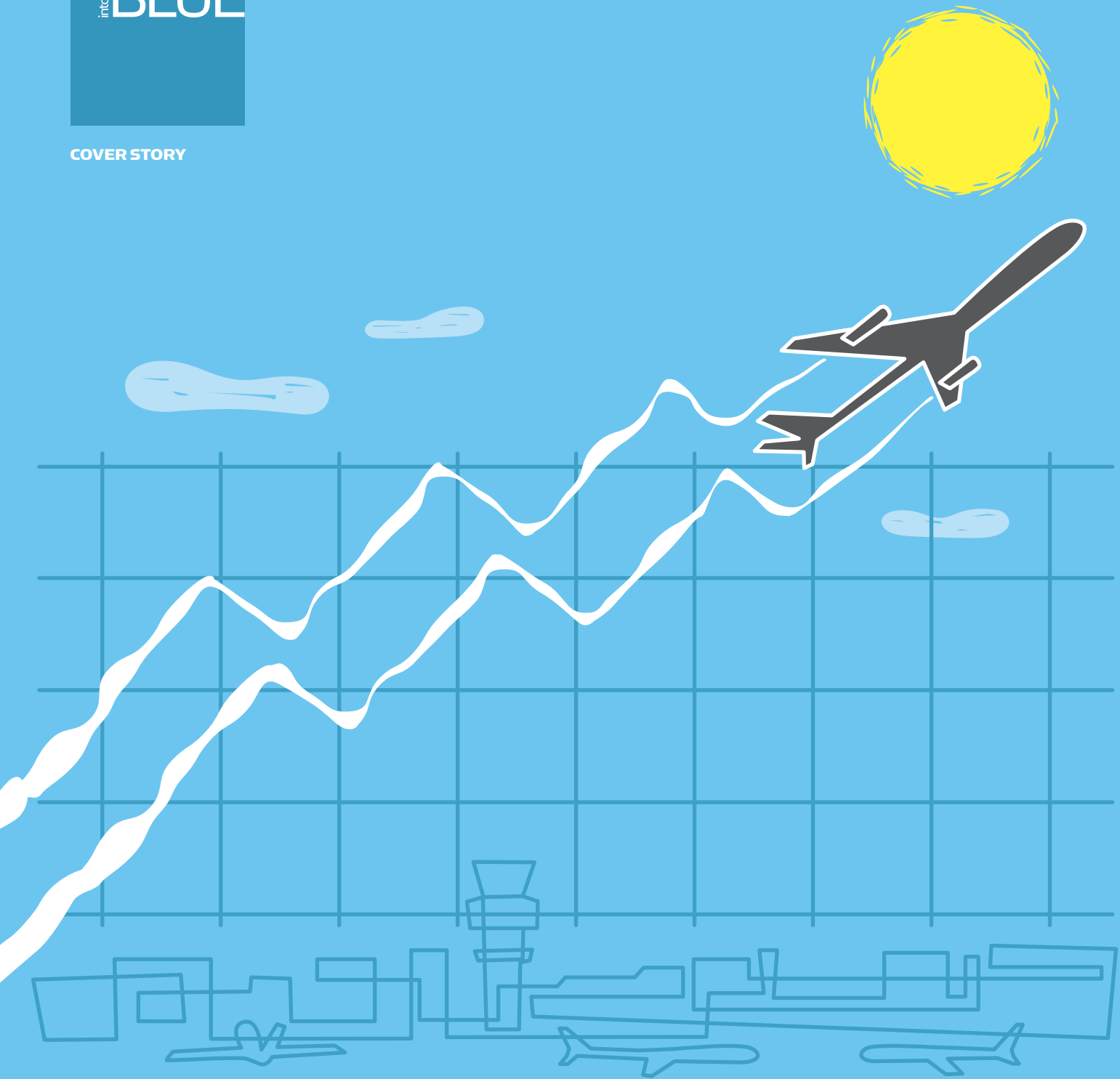
The Federal Aviation Administration (FAA) is proposing a rapid overhaul to U.S. pilot, flight attendant and aircraft dispatcher training programs and scheduling in an effort to enhance commercial aviation safety. After analyzing aircraft accidents over the past two decades, the FAA said many of those crashes "could have been prevented if the proposed training initiatives" had been in place. Some of the proposed changes respond to long-standing safety recommendations from the U.S. National Transportation Safety Board (NTSB). The proposed regulations will enhance traditional training programs by requiring the use of flight simulation training devices for flight crewmembers and additional training requirements in areas that are critical to flight safety. The proposal is part of the FAA's effort to reduce fatal accidents in which human error was a major contributing cause.

MOBILE GADGETS THREATEN IN-FLIGHT ENTERTAINMENT



Airlines around the world now spend millions of dollars annually upgrading their in-flight entertainment systems, but iPods and other mobile entertainment gadgets could render all that useless. In the past, many long-haul travelers flying in economy class have passed the time with movies and games using airlines' in-flight entertainment (IFE) system. But with USB ports and power sockets increasingly common on carriers such as Singapore Airlines and Cathay

Pacific Airways, the concept of in-flight entertainment could change. Adding to the mix are plans by a number of carriers such as Delta that have begun offering an Internet connection on board, allowing passengers to continue tweeting and updating their Facebook status instead of flipping channels on an IFE system. This could be a welcome shift for airlines, hit with weak demand for air travel and volatile jet fuel prices, as it could allow some potential cost savings such as licensing fees to production studios and maintenance fees. The growing popularity of low-cost netbook PCs and other mobile entertainment devices such as iPods and MP3 players could further hasten IFE's demise, as more and more airline passengers carry these gadgets with them when they travel.



There is no question that the global economic slowdown has hit the air transport industry, and hit it hard. The International Air Transport Association (IATA), which represents 230 airlines worldwide comprising 93 percent of scheduled international air traffic, has nearly doubled its loss estimate from the US\$4.7 billion it forecasted in March to now US\$9 billion for the year,

CAN AVIATION BE AN ENGINE THAT DRIVES ECONOMIC RECOVERY?

reflecting a “rapidly deteriorating revenue environment” and a sharp fall in both passenger and cargo

demand. All of this comes against a backdrop of a recent prediction by the International Monetary Fund that this year would be the first since the end of World War II to record a drop in global economic activity, with world output falling 1.5 percent — a situation that could further deepen the woes for the already ailing air transport industry.



“EVEN THROUGH TOUGH ECONOMIC TIMES, AIR TRANSPORT IS A RESILIENT AND INNOVATIVE INDUSTRY THAT DRIVES ECONOMIC AND SOCIAL PROGRESS ACROSS THE GLOBE – CONNECTING PEOPLE, COUNTRIES AND CULTURES.”

CHALLENGING TIMES FOR THE INDUSTRY

At the recent IATA Annual General Meeting and World Air Transport Summit, Giovanni Bisignani, IATA's director general and chief executive said the aviation sector is in turmoil. "There is no modern precedent for today's economic meltdown. The ground has shifted. Our industry has been shaken. This is the most difficult situation that the industry has faced."

The 2001 attacks in the United States had a major impact on air travel, but today's conditions are even worse than in 2001. After September 11, industry revenues fell

by seven percent, or US\$23 billion, from 2000 to 2002. The 2003 outbreak of Severe Acute Respiratory Syndrome (SARS) in Asia also led to a major decline in air travel, especially in that region. It took three years for the industry to recover lost ground from the events of 2001 to 2003, even on the back of a strong economy. This time, the industry is facing a 15 percent drop – a loss of revenues of US\$80 billion – in the middle of a global recession.

Although there have been growing signs of a bottoming out of the recession, the industry was severely hit in the first quarter of 2009 with 50 major airlines reporting losses of

more than US\$3 billion – and weak consumer confidence, high business inventories, unpredictable oil prices and the impact of Influenza A(H1N1) pose headwinds for future recovery. Additionally, with the crash of the financial sectors, financing became much tougher to obtain, forcing airlines to rethink business models and new fleet plans.

The pressure on the industry balance sheet is extreme as airlines maneuver through a very challenging time to forecast. Future traffic demand is unclear and fuel costs – which range from 30–50 percent of an airline's total operating costs – change rapidly from day to

day, so cash preservation is key. During more stable years, airlines were able to more safely secure hedging positions – enabling a clearer line of sight to future operating costs. But today, most airlines are betting on the volatility by taking fewer hedging positions and purchasing fuel at the spot prices. On the demand side, advance bookings, which once provided a clear picture of future revenues, are no longer consistent and predictable. Additionally, tickets that are being sold today are not providing the yield requirements that airlines need to be profitable, partly because so many of the higher yield business and premium travelers have not returned to the skies.

GETTING A JUMP ON THE DOWNTURN

2009 has been a rough year, but 2008 was a roller coaster for air transport as well. The industry lost \$8.5 billion in 2008 when high oil prices hit, and then the global credit and financial crisis slashed demand for business and leisure air travel.

While air transport was among the hardest hit industries in last year’s record run-up in fuel costs, many airlines responded swiftly when times got tough. They made dramatic cuts to non-fuel related costs, imposed new fees for various passenger services such as additional baggage or premium seating, and grounded less fuel efficient aircraft – all moves that

have helped position them ahead of the curve when this year’s economic collapse took hold. The wise and swift reaction has enabled airlines to keep load factors higher and to fare better than many others during this downturn.

SURVIVAL TACTICS

The key to survival for airlines during these challenging times has been keeping costs low and capacity closely aligned to uncertain demand. Airlines, like many industries, have worked to cut all unnecessary costs and are closely monitoring all capital expenditures. A number of airlines have deferred aircraft orders and the purchase of new spares by using components removed from parked aircraft. On the revenue side, most airlines have now implemented ancillary fees for items such as checked bags, priority seats and reservation fees.

For the time being, by cutting routes and costs, grounding planes and imposing fees, airlines are doing everything possible to weather the downturn – and are in a better position for recovery than many industries that were not as quick to react and adjust their operations accordingly.

AN ENGINE FOR ECONOMIC RECOVERY

As markets begin to eventually rebound, aviation will undoubtedly play a vital role in economic

recovery. Even through tough economic times, air transport is a resilient and innovative industry that drives economic and social progress across the globe – connecting people, countries and cultures. It forges links between nations and is an important facilitator of international trade, thereby promoting economic growth and development. Forecasts suggest that the global economy will become even more dependent on international trade over the next decade, with emerging markets like China and India leading the way.

Progress on new technologies, efficiencies and flexibility will help the air transport industry survive and emerge from the current economic crisis. Smart investments in air transport can pay off with jobs, boost other industries and serve as an economic catalyst. But newer, more fuel-efficient aircraft and products that enable more direct routes are only half the solution. Modernization and implementation of the next generation of Air Traffic Management (ATM) systems through the Federal Aviation Administration’s (FAA) NextGen ATM and Europe’s Single European Sky ATM Research (SESAR) programs, among others, will play a critical role in the evolution of the industry by ensuring capacity can be added with minimal constraints and maximum operating efficiency. Environmental factors will also play a part in future recovery and growth

helping to maximize fuel efficiency and reduce CO₂ emissions as programs such as the European Union’s cap-and-trade emissions trading scheme take effect and the commercial production of biofuels for aviation becomes a reality.

The implementation of new technologies that will enable the industry to realize the full advantages of a modernized ATM system will also be key as air traffic ramps back up. This will help increase efficiency, minimize environmental impacts and improve safety and capacity issues. Some of these key technologies include:

Automatic Dependent Surveillance-Broadcast (ADS-B)

ADS-B serves as the heart of the new ATM system and is an identification and communications technology that will allow planes to fly closer together without sacrificing safety, permitting increased airspace capacity. The system relies on Global Positioning System (GPS) satellites that enable aircraft to receive signals from satellites that will give its precise location. The aircraft then relays that data and other information about its speed and altitude to ground stations. Along with air traffic control data, the ADS-B network will transmit weather information, and flight information to displays in aircraft cockpits. The technology’s more precise locating of aircraft in the air and on the runways and

AIR TRANSPORT: A MAJOR CONTRIBUTOR TO THE GLOBAL ECONOMY			
<ul style="list-style-type: none"> ■ The air transport industry generates a total of 32 million jobs globally through direct, indirect, induced and catalytic impacts. 	<ul style="list-style-type: none"> ■ Aviation’s global economic impact was estimated at US\$3,560 billion in 2008, equivalent to 7.5 percent of world Gross Domestic Product (GDP). 	<ul style="list-style-type: none"> ■ The total value of goods transported by air represented 35 percent of all international trade last year. 	<ul style="list-style-type: none"> ■ Air transport is indispensable for tourism, particularly in developing economies. Over 40 percent of international tourists travel by air.
<p><small>*Statistics from the Air Transport Action Group’s report “The Economic and Social Benefits of Air Transport 2008”</small></p>			

more frequent updating of location data can help improve safety, plus save money and eliminate waste and delay. Giving controllers and pilots more precise positioning data can help them select the most efficient routes, which can cut fuel costs and emissions, reduce noise and result in fewer delays. The new system allows for more direct routes and will also be able to handle more aircraft while enabling the creation of new routes at different altitudes. This will boost safety and improve the flow of

Performance-Based Navigation

Required Navigation Performance (RNP), pioneered by Alaska Airlines nearly a decade ago, enables aircraft to navigate difficult terrain and fly more precise and repeatable paths, enabling shorter and more effective arrival and departure procedures. RNP helps reduce diversions, decrease fuel burn, save time and money and cut both emissions and noise. Now RNP operations are becoming more common at airports

accurate, more flexible and less susceptible to error sources than the 1930s-era ILS currently in operation. GBAS technology utilizes a ground system installed at an airport to identify and correct small errors in GPS satellite signals and then transmits this information to arriving and departing aircraft. This high-integrity, extremely precise positioning data can provide precision approach capability to all runway ends, maximizing airport capacity in all visibility conditions and

“SMART INVESTMENTS IN AIR TRANSPORT CAN PAY OFF WITH JOBS, BOOST OTHER INDUSTRIES AND SERVE AS AN ECONOMIC CATALYST.”

planes at airports while reducing ground backups and collisions by pinpointing planes on the ground.

The ADS-B network traffic component, which has been used in pilot programs in Alaska and Ohio, is far more precise and timely than radar, updating a plane's position about every second. Current systems rely on ground radar that sweeps the sky every three to 12 seconds. And in many areas radar coverage is sparse or non-existent, forcing controllers to add extra space between planes to ensure they do not collide. Computer screens in ADS-B equipped cockpits will depict other planes in nearby airspace and on the ground, giving pilots greatly improved situational awareness. Full implementation of ADS-B is expected to take another 15 years, but the FAA says the necessary avionics will probably be installed on 25 percent of the nation's airline fleet by 2014. Honeywell's avionics systems and products are key components of the future ADS-B system.

worldwide. There are airports that in bad weather can only be served with RNP approaches. Many of the operators claim a four to six percent savings benefit for each flight operated using RNP technology.

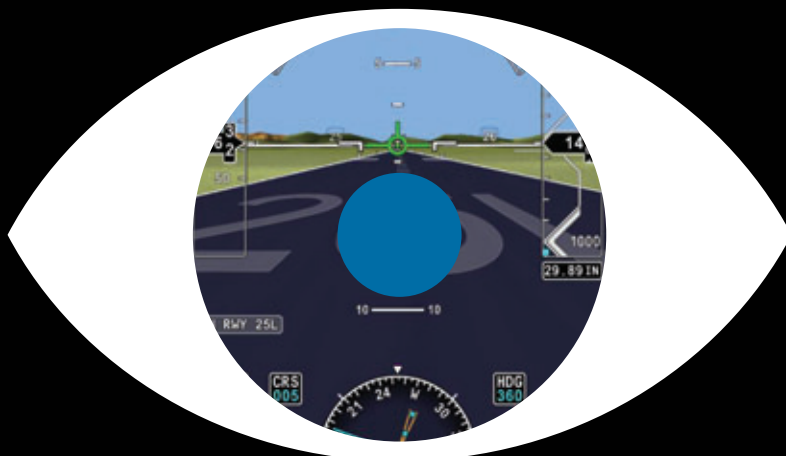
As more airlines tighten their belts and look at cost-cutting measures, a growing number of airlines are discovering the fuel savings and safety benefits of RNP and have requested FAA and other regulatory agencies' approval to take advantage of it. Honeywell offers all of the avionics necessary to equip an aircraft for RNP – from Flight Management Systems (FMS) to Enhanced Ground Proximity Warning Systems (EGPWS) to Inertial Reference Systems (IRS) – and will continue to strive to offer new RNP technologies that offer the right capabilities to airlines' operating procedures.

Precision Approach and Landing Capability

GPS Ground Based Augmentation Systems, or GBAS, harness the capabilities of a global positioning system and provide a precision approach signal that is more

minimizing delays and diversions – ultimately saving fuel and reducing emissions while also contributing to a safer operating environment.

Working with governmental agencies and air navigation service providers such as the FAA, International Civil Aviation Organization (ICAO), Airservices Australia and EUROCONTROL, Honeywell has developed the SmartPath™ Precision Landing System. SmartPath provides a cost-effective Ground Based Augmentation System (GBAS) solution to increase airport capacity, decrease air traffic noise, and reduce weather-related delays. By providing aircraft with very precise navigation data, SmartPath represents the latest technology in a CAT I certified GBAS solution for precision approach and landings, enabling aircraft to fly either complex or straight-in approaches. Easy to install, at major cost savings compared to ILS, SmartPath has received FAA System Design Approval and is available today.



FUTURE VISION: THE FLIGHT DISPLAY OF THE FUTURE

Flight displays have come a long way from the one-line monochrome text of the GPS displays of the early 1990s. Displays have progressed to larger, more

content-rich screens showing a variety of flight information. Screens have evolved from cathode ray tubes (CRTs) to flat panel technology that can present complex graphics, such as airport surface maps, automatic dependent surveillance-broadcast (ADS-B) and vertical situation display. Content has shifted from dedicated controls showing only navigation information, for example, to full-color, liquid crystal flat panel displays that show charts, maps and engine instrumentation images. Round mechanical gauges of the past are rapidly leaving today's cockpits and being replaced by interactive electronic displays with 2D and 3D images that communicate tactical and strategic flight information so it is easier for pilots to modify flight plans quickly and safely as well as monitor weather, terrain and air traffic. These new technologies are changing the way flight crews interact with their flight decks—helping to create better situational awareness and reduce crew workload.

One of these key technologies is Honeywell's SmartView™ Synthetic Vision System (formerly known as Integrated Primary Flight Display, or IPFD), a new product that is being adopted across multiple platforms for regional and business jets. SmartView is Honeywell's synthetic vision system, built on the foundation of Honeywell's Enhanced Ground Proximity Warning System (EGPWS) and its terrain database. The system uses cues that pilots already understand to provide them with a virtual VFR visual environment regardless of the time of day or weather conditions. The fusion of the EGPWS database with Honeywell's advanced Head-Up Display (HUD) symbology provides pilots

SITUATIONAL AWARENESS: PROVIDING A BETTER VIEW

Aviation authorities increasingly realize that air safety directly relates to the level of attentiveness a flight crew has of their airplane's status, position and attitude. Situational awareness, as it is called, includes knowing where the aircraft is in relation to its intended flight path, airports and surrounding terrain. It also involves understanding the airplane's attitude in relation to the horizon, such as whether the aircraft is banked left or right, pitched up for a climb or going too fast or too slow.

While situational awareness is not a big problem on clear days, it can be a major concern when flying in clouds, fog or at night. Reduced visibility normally means pilots must "scan" or "cross-check" a number of dials, needles and other indicators on the instrument panel and then interpret all the information and form a mental picture of the aircraft's situation.

SmartView synthetic vision takes advantage of modern computing power to interpret this data and provide an easy to understand, three-dimensional view that replicates what a pilot would see out the windshield on a clear day. The display also overlays flight symbols such as an icon indicating the planned flight path and range rings to indicate how far away any terrain is, making flying in instrument conditions more intuitive and generally safer.

an ambient, natural and continuous view of their flight path, terrain and navigational environment without changing the way the pilot uses their Primary Flight Display.

A BETTER VIEW LEADS TO BETTER DECISIONS

Nothing is more dangerous for a pilot than when he or she is blind to where the runway is—whether it is due to poor weather conditions or unfamiliar terrain. That is why pilots need technologies like synthetic vision, which combines sensors and a state-of-the-art avionics display symbology, to help serve as their eyes in hazardous conditions. SmartView was built to be a game changer in aviation safety—increasing situation awareness for the flight crew, no matter what the weather conditions are outside the aircraft.

SmartView is a tactical decision-making tool that helps the pilot make necessary short-term decisions during flight. It complements Honeywell's Interactive Navigation (INAV™). INAV is Honeywell's navigation display, which allows on-screen graphical flight planning. It is a strategic tool that allows the pilot to plan far in advance of events in the flight plan.

SmartView employs performance-based HUD symbology information to help the pilot determine the outcome of many navigation tasks, such as avoiding terrain and obstacles. The HUD symbology also helps the pilot understand in a very intuitive way where the aircraft is going and makes the energy management of the airplane, especially during critical flight phases such as takeoff and landing, more natural. In addition, the blending of symbology, such as range rings and runway centerlines with the terrain assures the pilot accurate distance information that's easily interpreted. SmartView also enhances the EGPWS system by backing up decision links in the accident chain even further, giving an even larger margin of safety. It gives pilots an unprecedented, coherent and continuous view of their flight path, terrain and navigational environment.



THE LAW OF PRIMACY

The Law of Primacy states that humans are better at doing tasks the way they originally learned to do them. All pilots learn to fly by looking through the windshield at the terrain, airports, etc. When they later learn how to fly in instrument conditions, they learn an entirely new way of keeping the airplane properly oriented and on course without outside visual cues. In general, pilots fly 80–90 percent of the time in “visual” conditions, out of clouds or fog.

Honeywell’s SmartView uses synthetic vision technology to enable pilots to fly in restricted visibility conditions the same way they originally learned to fly in clear daylight. Synthetic vision gets its name from the fact that the terrain displayed in the cockpit on the primary flight display (PFD) is a synthesized picture. It is derived from a digitized terrain database stored in the airplane’s avionics. The system does not require an infrared video camera or other sensor “looking” at the actual terrain. SmartView display symbology allows the pilot to easily understand where the airplane is heading, enabling pilots to fly in restricted visibility conditions.

SmartView synthesizes key information for the pilot and delivers it in an easy way that is:

- Ambient – The pilot makes no special effort to gather data
- Natural – The pilot makes no special effort to interpret the data
- Continuous – The pilot makes no special effort to update the data

Additionally, the HUD symbology—namely the icon that indicates the planned flight path—allows the pilot to easily understand where the airplane is heading. During a landing, to make sure the airplane is correctly pointed to the runway, all the pilot has to do is place the icon on to the runway.

A PROVEN AND USER-FRIENDLY SOLUTION

A major reason Honeywell’s SmartView synthetic vision system enhances safety is it makes flying simpler and easier by balancing the pilot’s workload. With a balanced workload, pilots can devote more of their attention to flying the aircraft. This is especially important when pilots are under stress during an emergency situation or flying in difficult weather conditions or challenging terrain.

EARLY ADOPTERS

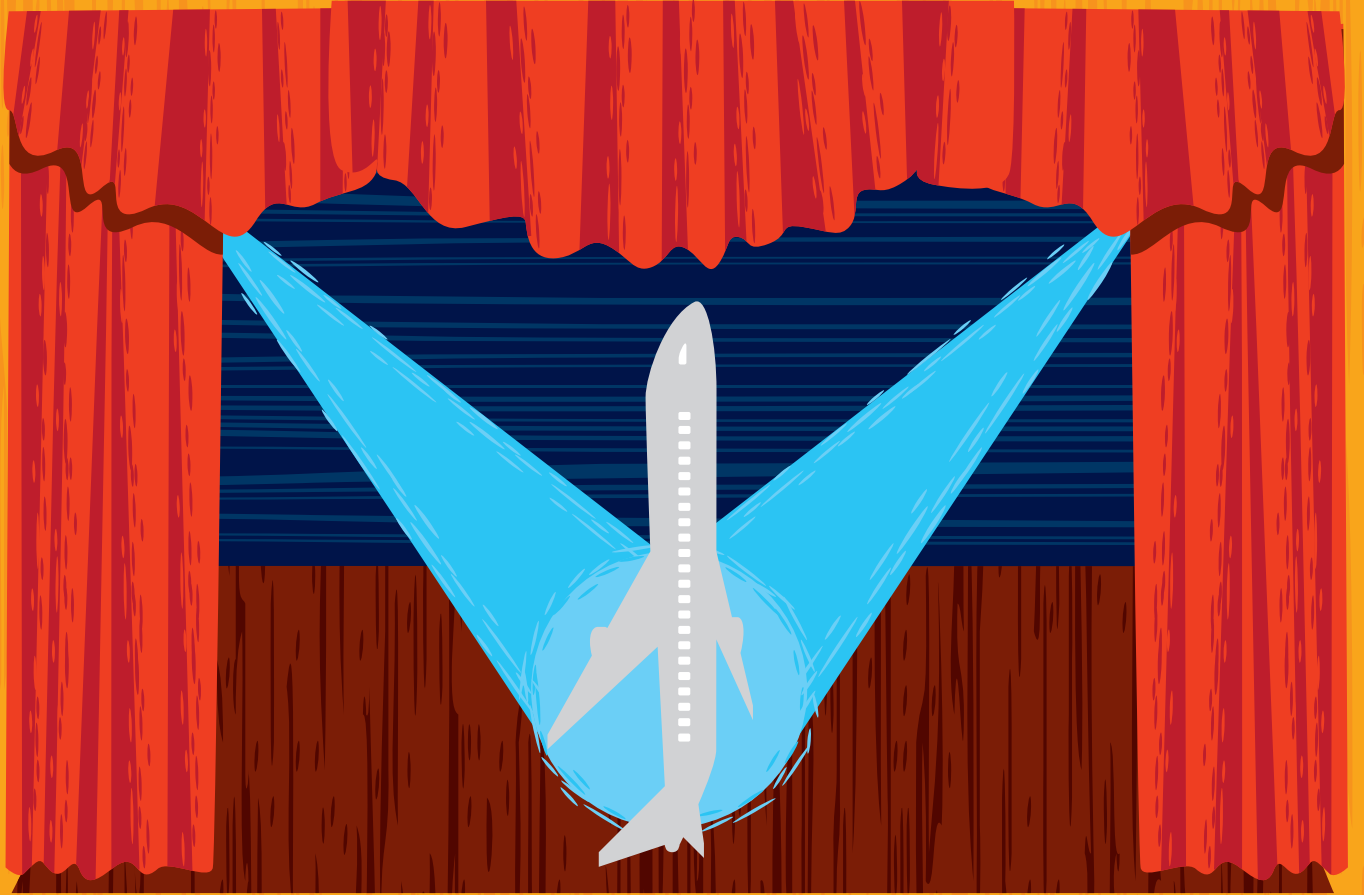
Military and business aviation are generally the first to adopt technologies like SmartView because their standards are different from air transport. SmartView can provide a tactical edge to military pilots. Additionally, many business and military jets fly into airports with more challenging landing conditions. But with the adoption of the next generation of Air Traffic Management systems, the interaction between the flight deck and ground-based systems will evolve and the need for systems like SmartView synthetic vision for increased safety and efficiency.

SmartView has been developed through a rigorous human-centered design process. Engineers have conducted extensive human factors testing during its development, which began in 1999. Using company and customer pilots of varying levels of experience, the system has logged more than 750 hours of testing in flight simulators and 200 hours in Honeywell aircraft. Because of Honeywell’s strong focus on human factors, it developed the SmartView system to be intuitive for a flight crew to interact with, providing only the information the pilot needs, when he or she needs it.

THE FLIGHT DECK OF THE FUTURE

The flight deck of the future will continue to evolve and will incorporate new functionality and even more intuitive systems—from speech recognition to touch-sensitive displays and other cutting-edge flight display technologies. With the modernization of the world’s Air Traffic Management (ATM)

systems well underway, today’s ground-based air traffic control systems will be replaced with a more efficient one that relies on satellite navigation and on-board aircraft avionics. This will also change the functionality of the flight deck of the future and how flight crews will interact with ground-based systems. Honeywell will continue to lead the way with expanded functionality for future generations of products in the synthetic vision family and beyond.



The Role of Regionals

Over the past few decades, regional jets have become an essential part of the global fleet. . . but do they play a part in riding out the current economic storm?

The global economic downturn is taking its toll on all sectors of the commercial aviation business – and regional carriers are no exception, following the lead of their major airline partners. Tumbling traffic numbers, rising operating costs, unstable fuel prices and, most recently, the financial meltdown have wreaked havoc on the regional aviation sector – resulting in scaled-back production plans and employee layoffs. After predicting a growing regional aircraft sector last fall, *Forecast International*, which provides market intelligence and analyses for the aerospace industry, now expects

3,500 regional aircraft to be built between 2009 and 2018, a six percent decline from the previous 10 years.

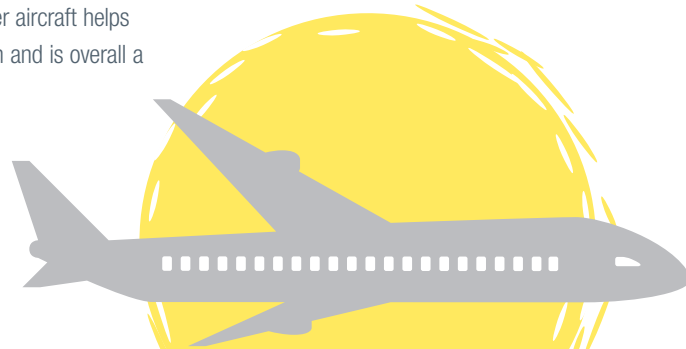
In the current airline environment, regional airlines are feeling nearly as much financial pressure as the major carriers are. While regional aircraft have historically outperformed larger aircraft during times of stress in the industry, this has not been the case during the current downturn. Major airlines and regionals alike are consolidating their route networks and grounding aircraft in response to reduced demand. And all this is occurring at a time when slowing passenger traffic and unstable fuel costs are putting pressure on the operating economics of regional jet aircraft. So rather than expanding into service areas abandoned by major airlines, market factors are forcing many regional carriers to themselves undergo consolidation.

The Economics of Matching Capacity with Demand

In the midst of the economic crisis, airlines have reacted to decreased demand for air travel by grounding planes and cutting back on routes, but taking capacity out of the system hasn't meant downsizing aircraft size. In fact, the opposite has held true as demand for regional jet airliners has been shifting upward to larger-capacity aircraft.

Airlines are increasingly parking less efficient, smaller regional jets, especially 50-seat jets, and replacing them with 70-seat and larger aircraft. With the current operational environment and fluctuating fuel prices, the economics of flying smaller 50-seat jets is difficult to justify. Flying larger aircraft helps reduce cost-per-seat, can reduce per-passenger fuel burn and is overall a more efficient and economical solution for many airlines.

While it depends on the operational profile of the carrier, it does seem that there will be a reduced role for regional jets for many airlines in the future. Smaller regional jets will most likely have a limited role but larger regional aircraft could continue to play a part in feeding hubs and serving point-to-point markets in a reduced role, and when costs stack up favorably. In its 2008–2017 Fleet Demand and Trend Forecast, aviation and consultancy firm The Boyd Group forecasts that more than 800 regional jets will be retired from U.S. fleets alone – mostly in the 50-seat category. And even as the industry recovers, many analysts predict that the trend toward larger regional aircraft will continue, especially in slot-restricted environments and with the increased focus on efficiency and lower fuel burn.



“Airlines are increasingly parking less efficient, smaller them with 70-seat and larger aircraft.”

A Turboprop Revival

The trend toward larger regional aircraft and the intense focus on environmental concerns, fuel prices and overall unit cost is leading to a resurgence of turboprops, the propeller-driven planes once shunned for being slow and noisy. Turboprops, generally used on shorter flights lasting one or two hours and carrying an average of 70 passengers, typically burn around 25 percent less fuel than similar-sized jets. Carriers such as Luxair, Flybe and Continental have all turned to turboprops to replace 50-seat regional jets on some short-haul routes. With record operating expenses hitting airlines large and small, turboprops could once again become the plane of choice for smaller commuter carriers who no longer believe regional jets offer value for money on shorter routes.

Emerging Markets, New Competition for Regional Aircraft

Challenged by the shifting economic conditions, regional aircraft have an uncertain future, but emerging economies could help drive the future for the regional sector. While regions such as North America and Europe are somewhat mature, emerging markets in Latin America, Africa/Middle East and Asia – especially China – all have a growing need to move an increasing number of passengers by air over relatively short-haul routes.

As many regional carriers consolidate, grounded aircraft could be absorbed by emerging markets such as China. But as these emerging markets grow, the question is whether they will purchase planes from the big players in the regional aircraft industry such as ATR, Embraer and Bombardier or will they be more inclined to purchase domestic aircraft, as China and Russia roll out their first entrants in the regional segment such as Commercial Aircraft Corp. of China's ARJ21-700. The ARJ21-700 made its first flight last November and Russia's Sukhoi Civil Aircraft Co.'s Superjet 100 performed its first demonstration flights at the Paris Air Show earlier this year.

Weathering the Economic Storm

In order to survive the current economic crisis, regional operators are focusing on the bottom line, looking at existing and next generation avionics to boost efficiency and safety while meeting operational requirements. With a focus on how to best conduct operations in the most cost-effective manner, regionals are emphasizing the need to gain efficiencies with their aircraft flight management systems (FMS). An FMS can improve operations, increase efficiency and decrease fuel burn. Regional operators are also using diagnostics and maintenance systems designed to improve turnaround times for aircraft entering scheduled or unscheduled maintenance.

Increased flight deck functionality can also result in significant efficiencies for regional aircraft. For example, Honeywell's Primus Epic® integrated avionics system improves situational awareness and decreases several factors, including overall operating costs, system weight by 450 pounds and the need for aircraft maintenance. Featuring large liquid crystal flat panel displays, the intuitive Interactive Navigation (INAV™) and patented Graphical Flight Planning (GFP) functionally allows for the quick and safe modification of flight plans with the ability to monitor weather, terrain and air traffic, which increases safety and pilot situational awareness and decreases pilot workload and the

need for training. The liquid crystal displays are scalable, allowing charts, maps and electronic engine instrumentation images to be resized for easier viewing with both 2D and 3D graphic models, helping decrease pilot workload. The system also is designed to allow the easy integration of aircraft utilities and fly-by-wire technologies, while also offering reductions in weight, wire count and power consumption requirements.

Performance-based navigation is also being touted as a source of operational cost savings. Using area navigation (RNAV) and Required Navigation Performance (RNP) procedures, operators can gain significant fuel savings. Honeywell's Primus Epic avionics system provides an opportunity for operators to move to RNP capability. Additional avionics systems that can help regional aircraft gain efficiencies and cut costs range from cockpit displays, digital air data computers, satellite communications systems, digital flight guidance systems, weather radar, moving map/GPS displays and traffic collision avoidance systems to Airborne Flight Information System (AFIS) and flight controls/autopilots.

regional jets, especially 50-seat jets, and replacing

The Next Generation of Avionics – Available Today and Positioned for the Future

During the economic downturn, the increasing focus on efficiency and cost reduction for regional operators has elevated the need for aircraft flight management systems (FMS) to increase aircraft performance and operational efficiency. Honeywell is leveraging its development investment by adapting technologies across various platforms and making products available faster. For example, Boeing's 747-8 will be using Honeywell's new 'core' FMS technology. This same technology will be used for the Planeview® II cockpit suite on Gulfstream's new G650 long-range business jet. Planeview is based on Honeywell's Primus Epic® integrated avionics suite, which is designed for regional and business jet platforms. Primus Epic is certified and already flying on Embraer 170/175/190/195 regional jets as well as a variety of business jets from Cessna, Dassault, Raytheon and Gulfstream, enabling superior aircraft performance, and:

- Enhanced safety through improved cockpit situational awareness and reduced workload
- A modular design that substantially reduces avionics line replaceable units (LRU) count and can more readily support upgrades for future technology

- Smaller, lighter system to provide more cabin living area and reduced aircraft weight
- Improved reliability and maintainability
- Easy integration of aircraft utilities and fly-by-wire technologies, while also offering reductions in weight, wire count and power consumption requirements.

With its unique software-based architecture, Primus Epic delivers unprecedented operations value as system updates such as future communication, navigation and surveillance/air traffic management (CNS/ATM)-related products are added. It is constantly evolving and being upgraded in order to incorporate the latest breakthroughs, while being ready for the breakthroughs to come. For example, Honeywell's new IntuVue™ 3-D advanced weather radar and hazard detection system will be included in the G650 configuration. IntuVue is also part of the AESS system, and available as a federated system on the B777, B747, B737 and will be certified in 2010 on A320, A330, and A340. By leveraging resources and implementing technology across platforms, Honeywell enables operators to capitalize on technologies that reduce costs that were not previously available to them and positions them for future growth and easy implementation of new technologies.

PERSPECTIVES

HONEYWELL AV8OR ACE™ ENABLES PAPERLESS COCKPIT

EAA AirVenture Oshkosh has become one of the premier aviation events in the world. This event brings all segments of aviation to Oshkosh for a weeklong celebration of flight.

“Oshkosh” has become the home of new innovations and annual announcements that impact the aviation industry. With that said, Honeywell recently announced the launch of its new seven-inch-touchscreen handheld GPS product, the Bendix/King AV8OR™ ACE, at the EAA AirVenture air show.

The AV8OR ACE is Honeywell’s latest offering in the AV8OR family of handheld devices. Like the AV8OR, the AV8OR ACE is a low-priced way

to get weather in the cockpit and navigation guidance in both the aircraft and the automobile. Plus, the easy-to-use touchscreen interface means users will be spending less

time fumbling with knobs and more time flying. The AV8OR ACE provides geo-referenced FAA charts, eliminating the need for general aviation pilots to carry paper charts. It includes all of the same capability found in the AV8OR Handheld – a Wide Area Augmentation System (WAAS) GPS, automotive navigation, regional databases, airport information services including fuel pricing, and interfaces for traffic and weather.



The AV8OR family includes a range of handheld products for any budget, from the AV8OR Handheld to the AV8OR Vision 3D, available later this year. Introduced last year, the AV8OR Horizon 3D provides synthetic vision in a touchscreen electronic flight bag for less than US\$5,000. To learn more, visit Honeywell’s AV8OR online at www.bendixking.com/AV8OR.

The Airbus A380 made its first visit to an air show in North America when it landed recently at the Oshkosh EAA AirVenture. Thousands lined up for an opportunity to see the double-deck 800-passenger plane. It was the first time the public has been allowed in large numbers to walk through the world’s largest passenger airliner without first having to buy a ticket on Qantas, Singapore or Emirates airlines – the only companies flying the plane, which made its first commercial flight less than two years ago.

A FOCUS ON CONNECTING WITH CUSTOMERS



Honeywell’s Customer & Product Support organization is continually looking for opportunities to increase customer communications and strengthen relationships. Now more than ever, providing a great customer service and support experience has become a key differentiator. This means staying connected with customers and addressing their service needs, treating them well, and responding in a timely and professional manner.

One method of staying connected with customers is the Honeywell regional operator conferences. The benefits to Honeywell and customers are reduced travel costs as conferences are typically held in close proximity to customer facilities, are offered throughout the year in multiple regions, and provide the opportunity to bring together

Honeywell technical experts with customers to discuss and resolve concerns and issues.

Honeywell recently hosted a 2009 Air Transport operator conference in Prague, Czech Republic, where customers attended a two-day technical and support process forum. At the conference, customers were briefed on a range of technical and support topics for a variety of Honeywell products. These conferences also provide a key indication of customer satisfaction with Honeywell products and services.

Starting this year, a procurement meeting track was added to the conference agenda to provide information to buyers on the support offered to them. This included information on ordering and procuring parts through Honeywell

Aerospace Trading Company and optimizing the Honeywell ePortal for ordering and status. A second innovation deployed at this year's conferences is a customer interactive voting system that provided feedback on customer demographics as well as sentiment on support services. Plans are currently underway for a November conference in Phoenix, Arizona. It will be supplemented by several smaller regional briefings, conference calls with Internet distribution of the conference presentations and Internet broadcasts that reach out to customers unable to attend.

Another method to connect with customers is the Air Transport & Regional Customer Collaboration Web site designed for customers, Honeywell Customer & Product Support and Honeywell Account team personnel to share the latest updates on key programs and activities. Information includes the current status of technical programs, regular updates on service-related difficulty improvements, presentation materials as well as questions and answers from operator conferences, and information on upcoming meetings or events. A blog and discussion boards provide for two-way interaction allowing customers to post questions and receive answers or inputs from other operators and Honeywell.

NEW AIRLINES MICROSITE

Honeywell recently launched a new airlines microsite at www.honeywellairlinesolutions.com. The site provides more information about Honeywell's extensive offerings in the areas of aftermarket programs, safety, air traffic management and fuel efficiency solutions. The easy-to-navigate site also enables users to view and download collateral, advertising and copies of *Into the Blue* magazine.

- Honeywell will provide avionics and its fuel-efficient Auxiliary Power Unit (APU) for Aviation Capital Group's (ACG) fleet of 68 new Airbus A320 aircraft in a deal valued at more than \$40 million. Airlines and lessors like ACG are selecting the Honeywell's 131-9A APU over alternatives because of the 5 percent fuel savings, lower carbon dioxide emissions, increased power, class-leading reliability and the low maintenance costs.
- Honeywell's IntuVue™ 3-D Advanced Weather Radar has reached approximately one million hours of proven flight time and more than 2,000 firm orders and installations. Operators using IntuVue are experiencing 45 percent fewer turbulence-related incidents compared to aircraft equipped with conventional radars. IntuVue's slim design and high reliability can reduce operating costs by 53 percent, can reduce weight by 25 percent and can reduce maintenance costs by 30 percent as compared to other commercially available products.
- Honeywell recently announced that its 131-9A Auxiliary Power Unit (APU) is averaging more than 10,000 hours between unscheduled repair events, a 70 percent improvement over other APUs in its class size, providing airlines with real, tangible cost savings and greater aircraft availability. The 131-9A APU is the most commonly used APU for single-aisle commercial transport totaling more than 1,700 APUs in service including forward-fit and retrofit, and is available on Airbus A318, A319, A320 and A321 platforms.
- Boeing will begin offering a standardized version of Honeywell's Runway Awareness and Advisory System (RAAS), a part of Honeywell's new SmartRunway™ safety program that provides visual and aural alerts to the crew about runway situational awareness as a forward-fit option on 777 and 747-8 aircraft, available beginning in late 2009. The next-generation 737 will follow suit in early 2010.
- Honeywell recently unveiled SmartLanding™, a new product that builds on existing Honeywell technologies to address runway excursions that will alert pilots if the aircraft's approach is unstable and at risk for an unsafe landing. SmartLanding improves pilot situational awareness and helps break the chain of events that can lead to a runway excursion by providing aural and visual alerts upon approach only if the aircraft has not met established safety criteria.
- Honeywell recently announced that it has been selected as one of the 15 industrial companies, Air Navigation Service Providers and airports that joined Eurocontrol and the European Commission in the Single European Sky Air Traffic Management (ATM) Research Joint Undertaking (SESAR JU). The SESAR JU represents the technology pillar of the Single European Sky, an initiative from the European Commission to reform the architecture of the European Air Traffic Management System.
- Honeywell recently completed the installation for its SmartPath™ Precision Landing System at Bremen Airport in Germany. Honeywell's technology is a ground-based augmentation system that supports precision approach and landings using Global Positioning System (GPS) satellite data and transmits digital guidance signals to aircraft systems. Replacing ILS with GBAS technology has been identified in the FAA's NextGen and Eurocontrol's SESAR programs as critical enablers for improving air traffic capacity.

DEPARTURES

On the Edge

Getting the bare essentials on airline safety.



For Air New Zealand's Boeing 737 domestic flights, a new in-flight safety video leaves little to the imagination in the name of flight safety. Targeted to improve passenger attention to the often overlooked passenger safety video shown before takeoff, the "Bare Essentials of Safety" features flight attendants cheerfully giving standard safety instructions, including baggage stowage, seat-belt usage, tray table securing, emergency exit information and more, while clad only in body paint that mimics their air crew uniforms. The video uses strategic camera angles, well-placed props and good timing, along with a little Kiwi charm, to keep things family friendly for passengers.



Tech Bits

Quietly advancing aircraft design

Everyone knows it's a noisy world, especially around the world's busiest airports. From takeoff to touchdown, every source of aircraft noise is being reviewed as part of NASA's Aeronautics Research Mission Directorate to develop next generation aircraft designs that create less noise, improve fuel consumption and range, and allow for smaller airport operation on shorter-than-average runways. Targeted for introduction in the next 10 (N+1), 20 (N+2) or 30 (N+3) years, each design generation would offer progressive and measured advancements. The N+1 design would look similar to current aircraft with cooler, slower operating engines in a more streamlined, noise-reducing fuselage. N+2 aircraft looks to feature a more "blended wing" design with top mounted engines to reduce noise levels. The N+3 design is still being determined and NASA is sponsoring new research to produce ideas for consideration.

Flight Plans

Beijing is China's political, economic, cultural and educational center, as well as the nation's most important center for international trade and communications. This modern and fashionable city is also a showplace for the majesty and might of the powerful dynasties of Imperial China. While visiting the International Air Safety Seminar, we invite you to explore China's ancient past and marvel at these centuries-old wonders of architecture and design.

Temple of Heaven

Chongwen District, No. 2 Tian Tan Dong Li
Tel: +86 (010) 67028866
Hours: 6 a.m. to 8 p.m.

Constructed in the 15th century, this UNESCO World Heritage Site was considered the meeting point of Earth and Heaven and was visited each year by the emperors of the Ming and Qing dynasties to pray for good harvests.



Forbidden City

Dongcheng District
Tel: +86 (010) 65132255
Hours: 8:30 a.m. to 4:30 p.m.

Recognized as one of the five most important palaces in the world, the Forbidden City was the imperial palace of the Ming and Qing dynasties and is the world's largest ancient palatial structure.



Summer Palace

No. 19, Xin-jian-gong-men Road, Haidian Dist., Beijing
Tel: +86 (010) 62881144
Hours: 7 a.m. to 5 p.m.

Another UNESCO World Heritage Site, the Summer Palace is a masterpiece of Chinese landscape garden design. As the summer retreat of the Qing dynasty emperors, this is the best-preserved and largest imperial garden of its kind in the world.



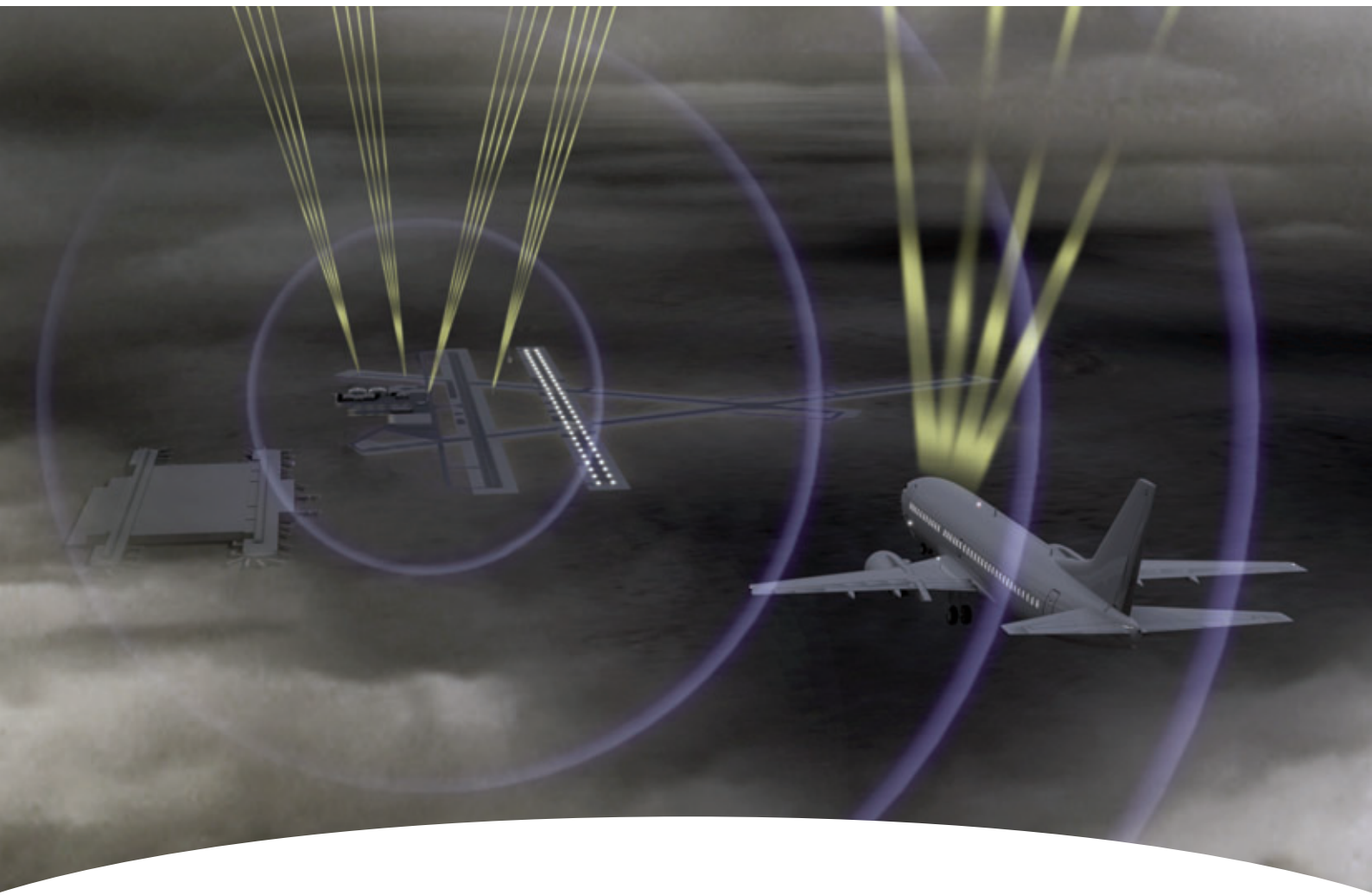
Upcoming Events

AT&R Operator's Conference – Americas
November 2-3, 2009
Phoenix, AZ

International Air Safety Seminar (IASS)
November 2-5, 2009
Beijing, China

Dubai Airshow 2009
November 15-19, 2009
Dubai, UAE

proven precise



Honeywell SmartPath™ Precision Landing System— The First and Only FAA-Approved GBAS

The next generation of precision navigation and control has received FAA System Design Approval and is available today.

Honeywell SmartPath Ground Based Augmentation System (GBAS) delivers a cost-effective solution that increases airport capacity, decreases air traffic noise and reduces weather-related delays. By providing extremely precise landing guidance data, SmartPath enables aircraft to fly either straight-in or complex approaches. Easy to install, at major cost savings compared to ILS, SmartPath delivers proven precision. Learn more today.

Honeywell

For the details on Honeywell's SmartPath solution, call **1.800.601.3099**,
International **602.365.3099** or visit www.honeywellsmartpath.com

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