

Honeywell Aerospace

Enhancing Value by Making Operations Safer, More Reliable, More Efficient

Honeywell Aerospace is a leading provider of advanced systems solutions for navigation, integrated airborne avionics, cockpit displays, safety, surveillance and communications. Honeywell's primary focus is to enhance customer value by making operations safer, more reliable and more efficient through application of their unique capabilities in sophisticated avionics and world-class aftermarket service and support.

Preparing for the Future: The key element of the U.S. transportation system

Honeywell is taking an active leadership role to provide NextGen and air traffic modernization technologies and products that benefit the economy and the environment as well as promote safety and efficiency that reduce the emission of carbon dioxide.

Building 'Highways in the Sky'

Airports are the most visible component of the aviation infrastructure. Tangible evidence of congestion relief is realized through new or upgraded terminals, taxiways, and runways. The rest of the infrastructure — the "highways in the sky" — are the virtual on and off ramps that connect the globe, and are far less visualized. New arrivals and departures using RNAV, RNP and Honeywell's SmartPath Ground Based Augmentation System (GBAS) can provide the structure for these "ramps," while Honeywell's Traffic Alert and Collision Avoidance system, incorporating ADS-B and Airborne Traffic Situational Awareness (ATSAW) technology, will allow aircraft using these ramps to fly in-trail procedures, sequencing, merging and passing operations. Such operations provide maximum safety while reducing the aircraft separation requirements for greater airport and flight efficiency to minimize delays, fuel burn and passenger headaches.

Air Traffic Modernization and the Environment

Over the past 30 years, airlines have more

than doubled their average fuel economy. However, our air traffic system creates 10 to 15 percent of the inefficiencies, resulting in more than 10 million metric tons of carbon dioxide emitted unnecessarily in 2008 within the United States alone.

Technologies that Save Fuel and Reduce Emissions

Honeywell's systems employ navigation capabilities which provide the basis for precision navigation that saves fuel and reduces emissions. The result is significant decreases in distance, time flown and fuel consumption. Required Navigation Performance (RNP) is the latest advancement in RNAV systems evolution.

Examples of RNP savings:

- ▶ Australia's Qantas Airlines fleet of 737s fly more than 100 RNP procedures per day. These procedures in Brisbane alone cut approximately 15 miles and more than 1,600 pounds of CO₂ emissions on every approach.

- ▶ Southwest Airlines recently operated a B727 roundtrip demonstration between Dallas Love Field and Houston Hobby using RNP procedures. The result — 904 pounds of carbon dioxide savings, part of its \$175 million program to implement RNP fleet-wide.

- ▶ Since 2005, Alaska Airlines, an early RNP pioneer has documented 5,300 flights that avoided diversions by using RNP procedures. In 2008, this resulted in a cost savings of \$8 million.

- ▶ UPS and SAS use Continuous Descent Arrivals (CDA) and have reported fuel savings between 250 and 465 pounds of fuel per arrival.

Honeywell's SmartPath™ Ground-Based Augmentation System (GBAS) Reduces Costs and Increases Aviation Safety

Fifteen of our top U.S. airports experience greater than 25 percent reduced capacity when ceilings are below 200 feet due to limitations with current Instrument Landing System (ILS) equipment. GBAS is the next generation precision landing system technology. Honeywell's SmartPath GBAS uses a ground system

installed at an airport to identify and correct small errors in GPS satellite signals, and transmits this information to arriving and departing aircraft.

Using ILS equipment during adverse weather, aircraft are often forced to wait in holding patterns — burning extra fuel or worse, diverted to alternate airports. SmartPath technology provides precision approach capability to all runway ends, maximizing airport capacity in all visibility conditions, minimizing delays and diversions, saving fuel and reducing emissions while significantly contributing to safer operations.

Honeywell's SmartPath GBAS system was recently installed at Bremen airport in Germany. The Bremen installation is one of eight Honeywell GBAS stations operating worldwide, with additional installations planned at airports in the U.S. and Europe throughout 2009.

Accelerating NextGen Implementation & Global Air Traffic Modernization

Honeywell's vision for future Air Traffic Modernization is clear — implement the technology available today and continue building on that technology to make flight safer, more environmentally friendly and more affordable. Honeywell is committed to providing the structure, leadership and resources needed to move the global air traffic modernization forward. We encourage our global network of government representatives, customers, suppliers and competitors to help each country achieve the advancements in technology and safety for the industry.

For more information about how Honeywell is supporting NextGen technologies and Air Traffic Modernization, go to www.honeywell.com/ATMsolutions

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