CUSTOMER SUCCESS STORY

Emirates works with Honeywell Aerospace to reduce risk of runway incursions and excursions

Simple software upgrades combat one of aviation's most serious safety concerns

Honeywell Aerospace

Overview

Runway incursions and excursions are a major cause of concern for the aviation industry. Emirates and Honeywell Aerospace worked hand-in-hand to develop two new solutions that are designed to reduce the risk of these dangerous and expensive incidents.

Background

Wholly owned by the Government of Dubai, Emirates Airline has grown from modest beginnings to become the largest airline in the Middle East and a globally influential travel and tourism conglomerate.

On October 25, 1985 it flew its first routes out of Dubai with just two aircraft, a leased Boeing 737 and an Airbus 300 B4. It now operates over 2,500 flights a week to 133 cities in 77 countries across six continents. With a fleet of almost 200 aircraft, it is the world's largest operator of both Airbus A380s and Boeing 777s and its 2012 order-book stood at more than 230 aircraft worth approximately US$84 billion.

Recently, Emirates carried 34 million passengers and 1.8 million tonnes of cargo in a single financial year and, to keep pace with its demanding schedules, it has one of the highest aircraft utilisation figures in the world.

Business need

Emirates' growth relies on a constant commitment to increase safety and control cost, so runway incursions and excursions are major concerns.

These incidents are among the National Transportation Safety Board's top ten safety issues and they are estimated to cost the industry more than US$1 billion a year.

These costs stem from casualties, injuries, hull losses, aircratt inspections, repairs, lost capacity and closed runways or airports. Bad publicity increases the damage.

"At Emirates we were thinking about areas where we could be vulnerable as an airline and about advanced safety. One of them was runway incursion, mainly at the busy airport here at Dubai," said Capt Alan Stealey, divisional senior vice president, flight operations, at Emirates."

"Runway incursions are still a significant cause of accidents and incidents worldwide and it's said that 85 per cent are caused by lack of situational awareness by the pilot."

Honeywell Aerospace's own analysis of incidents over a 12-year period showed 40 per cent of runway incursions were caused by poor positional awareness and 45 per cent by poor traffic awareness.

Already operational in more than 40,000 aircraft, Honeywell Aerospace's enhanced ground proximity warning system (EGPWS) does much to increase aircraft safety and situational awareness but Emirates wanted to go further, particularly for approach, landing and taxiing on the ground.

"We wanted systems that could improve taxiing and landing safety, complement existing pilot safety procedures and were configurable, so they could be standardised for our entire fleet," added Stealey. "We wanted advisories that would provide maximum benefits, reducing aircraft insurance and the costs of hard landings, and that would offer best-in-class safety solutions."

Quick facts

Honeywell Aerospace solution

SmartLanding®/SmartRunway®

Customer results

- Reduces risk of runway incursions and excursions, resulting in improved safety and cost avoidance
- Systems can be used at all Emirates' worldwide destinations and need no input from the ground
- Training is minimal because these are progressions of existing technology and implementation is a simple software upgrade that doesn't require aircraft to be removed from line service

Why Emirates Airline chose Honeywell Aerospace

- Emirates was able to collaborate with Honeywell Aerospace and have input into developing and testing these new safety solutions
- The airline wanted to work with a supplier who had tried and trusted aircraft safety technology
- Honeywell Aerospace EGPWS systems, on which SmartLanding and SmartRunway are based, were already being used

Customer

- Name: Emirates Airline
- Location: Dubai, United Arab Emirates
- Industry: Airline
- Website: emirates.com

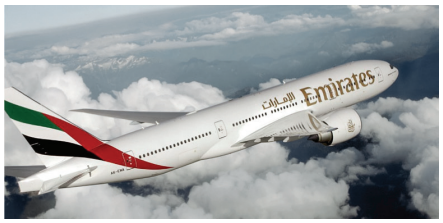
Solution

Emirates and Honeywell Aerospace joined forces in the development, testing and certification of two new safety solutions, SmartLanding® and SmartRunway®. Both are simple software upgrades to EGPWS and SmartRunway is the next generation of Honeywell Aerospace's runway awareness and advisory system (RAAS).

Working hand-in-hand, the companies built a dedicated certification and implementation team that involved flight operations, flight training facilities, quality assurance, aircraft maintenance, design engineering and supply chain.

SmartLanding and SmartRunway are now in use across Emirates' fleets of Airbus 330, A340 and Boeing 777 aircraft.

SmartLanding helps prevent hard or long landings by alerting pilots if the aircraft is approaching the runway too high, too fast or is not properly configured.



It complements standard operating procedures (SOPs) and flight operation quality assurance (FOQA) programmes to ensure compliance with stabilised approach criteria. The aircraft should be stable at 1,000 feet above the ground; it must be stable at 500 feet and must be proceeding on the correct vertical path at the correct speed and properly configured.

SmartRunway improves situational awareness by providing positional advisories and graphical alerts to crew members during taxi, takeoff, final approach, landing and rollout. Developed to reduce the likelihood of runway incursions, it interfaces with Honeywell Aerospace's worldwide terrain and runway database and adds new graphical alerts to the existing aural alerts in RAAS. Its design is also suitable for the future addition of automatic dependant surveillance – broadcast(ADS-B) functionality.

> "Emirates is a great fan of these systems. We have got a suite of systems from Honeywell Aerospace which enhance our safe operation."

Captain Alan Stealey,
Divisional Senior Vice President,
Flight Operations, Emirates

Benefits

"We had great input with Honeywell Aerospace in the development of these systems and we like them because they are simple progressions which require minimal training and risk involved in the implementation. They are quick software updates which require no flightdeck changes that could ground aircraft for too long," said Stealey.

"Honeywell Aerospace has a really great suite of systems here and a principal reason why we like them is that they are aircraft-based technology that do not require any input from the ground. This is beneficial when we operate in and out of airfields where infrastructure and the serviceability of ground aids are lacking."

Emirates believes that the oral warnings given by SmartLanding and SmartRunway enhance safety. Rather than watching a moving map within the flightdeck, pilots can listen to alerts but still look around as they taxi.

Training is also easy because the systems are intuitive and logical and simulator modifications involve just a simple software upgrade. Emirates runs computer-based training and also has a distance learning capability for pilots.

"Perhaps the biggest advantage is that once these systems are installed they work worldwide," added Stealey.

"We want this facility at all airfields that our aircraft may go to, including our destinations and our diversion airfields. This could be up to 400 locations and if we were to use moving map displays they would be very difficult to keep up to date."

"The software that is used in the SmartLanding/SmartRunway adapts itself to every single airfield so this is a great saving in terms of cost and also a great facility for us as we fly worldwide. They are also built on the tried and trusted EGPWS system that pilots have confidence in."

"Emirates is a great fan of these systems. We have got a suite of systems from Honeywell Aerospace which enhance our safe operation."

Emirates is now reviewing its SOPs in the light of SmartLanding and is likely to bring in a mandated 'go around' for any approaches that do not meet its criteria. It is also working with Honeywell Aerospace on future developments that will go even further to ensure flight safety.

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C61-1221-000-001 | 11/23
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