

Profiles in Success:

NORTH AMERICAN AIRLINES GAINS GLOBAL COMMUNICATION

Operational Control of Aircraft Using AMS and Iridium



On any given day, North American Airlines (NAA) might ferry U.S. military troops and their families on a route that leaves Norfolk, Va., and makes stops in the Azores Islands and in Sicily before touching down in Bahrain in the Middle East. The airline routinely flies into such remote locations as Diego Garcia, an island outpost in the middle of the Indian Ocean.

That's a major shift from the airline's roots as a domestic carrier that, for years, flew scheduled service to U.S. destinations.

As NAA evolved into an international charter carrier, a move completed in May 2008, the airline's management faced a pressing need: to significantly improve long-range voice and data communications between its ground crews and pilots, and to ramp up operational control over its fleet of 11 Boeing 767-300ER and Boeing 757-200 aircraft.

"We were looking for a low-cost, reliable, robust communications strategy," said Paul Sterbenz, NAA's vice president for strategic development.

NAA found the solution with AeroMechanical Services (AMS), a provider of real-time data communications for the aviation industry and an Iridium Value-Added Manufacturer headquartered in Calgary, Alberta, Canada.

As of June, all of NAA's aircraft have been outfitted with AMS' Automated Flight Information Reporting System

(afirs[™]). The system consists of an electronic "smart" box that attaches to an aircraft's cockpit instrumentation panel and a Web-based AMS ground station, called UpTime[™], which receives and transmits data and other information to designated recipients via e-mail, the Internet and other means.



With afirs, North American is now monitoring its aircraft's onboard avionics in real time, including data from GPS and Flight Data Recorders, or the "black box," and maintaining two-way voice and data communication links between its aircraft and Air Operational Center in Jamaica, N.Y. Voice and short-burst data messages describing an aircraft's operating performance – typically sent every five minutes while flying – are transmitted over Iridium's satellite network, giving NAA seamless global coverage.

"Our operational control capability has been materially improved, and that makes me sleep better at night," Sterbenz said. "afirs' over Iridium gives us full visibility over the precise location and operating condition of our aircraft from anywhere in the world. It's a huge move from where we were a year ago, and we have hardly scratched the surface of what this technology is capable of providing us."

Sterbenz said the pricing of afirs is attractive because NAA is billed based on actual use during a flight. "We pay a fixed price per hour based on flight hours, which holds our costs down when our hours are low and, if our hours are high, we can certainly afford the price," Sterbenz said.

NAA, with a payroll of about 800 employees, operates out of JFK Airport in New York. While the U.S. military and government agencies are NAA's primary customer, the airline books charters with sports teams and musicians on world tours. Last year, NAA provided air transportation for then presidential candidate Barack Obama and his campaign staff.

Since introducing afirs/UpTime in 2004, AMS and its marketing brand, FLYHT, have landed contracts to provide the service to 31 aviation business customers representing more than 750 aircraft flying daily in the Americas, Europe, Africa, the Middle East, China, South Asia, the Caribbean and the Antarctic. "Our box is certified for about 30 different types of aircraft already, including Boeing, Airbus and Bombardier models," said Richard Hayden, president of AMS.



AMS' current product, the afirs 220, is a compact 8.7 pounds. The cobalt blue device monitors data emitted from aircraft

sensors that gauge such things as engine temperature, excess vibration and system deviations that might indicate a need for maintenance, as well as such routine readings as altitude, heading and speed. A low-drag dual antenna, less than an inch tall and containing GPS and Iridium's satellite modem, is mounted atop the aircraft.

The afirs 220 can be custom programmed to capture, record and analyze pre-selected data. It automatically packages high-priority data into a message that is sent over Iridium to the UpTime ground station, while lower-priority data is saved to a storage card for downloading later. At redundant UpTime stations, AMS partner IBM hosts

Web servers that receive incoming data and forward the messages over secure Internet links to the airlines and others designated to receive them. The transmission from air to ground to customer occurs within seconds.

For NAA, an attractive feature is that the satellite voice capabilities connect directly into the aircraft's cockpit communications panel. "The pilots hear the phone ring in their headsets and simply pick up their microphone as they would answer a radio call," Sterbenz said.

"Before afirs, NAA relied on cell phones and HF radio to talk with pilots. That posed problems in remote areas where cellular service is unavailable and when atmospheric conditions interfere with HF radio reception," Sterbenz said.

Recently, NAA dispatchers using afirs satellite voice helped a pilot maneuver ahead of a thunderstorm and safely land a group of U.S. military troops at a planned stop in Dallas. Without that instant communication, the airplane probably would have been diverted to another airport.

"We avoided a pretty serious operational issue with passengers in the wrong place and missing their connections," Sterbenz said.

NAA uses afirs to monitor trends in aircraft engine performance. Every two hours during a flight, data messages



are sent to the engine manufacturers of NAA's airplanes, providing such data as turbine revolutions, pressure ratios and temperature. Before getting afirs, NAA's pilots, once per flight during cruise, wrote an engine's critical parameters in a logbook, which a clerk later typed into a database. "The afirs technology, besides eliminating the possibility of human error while transcribing data, has helped NAA better monitor aircraft maintenance needs," Sterbenz said.

"If this engine trend monitoring prevents one unscheduled engine removal in Kuwait, which we've had in the past, afirs has paid for itself for several years," Sterbenz said. "That's where you can find your return on investment."



Already, afirs has paid dividends for NAA in terms of better customer service and operational reliability, and Sterbenz said he expects to see more improvements. Soon, NAA will use afirs to record the out, off, on and in times of its aircraft, eliminating the need for pilots to manually record their take off and landing times, a key component in maintenance scheduling. The airline is working with the Federal Aviation Administration to activate afirs' text messaging capability for communications between aircraft and ground crews. It is exploring the possibility of tapping into an afirs program that enables an airline to manage fuel use to reduce both costs and emissions.

In one intriguing possibility, NAA expects to participate with AMS and several other airlines to demonstrate afirs'



capability to continuously stream data from an aircraft during an in-flight emergency. The AFIRS 220 box can be remotely activated to stream data under certain conditions, including loss of cabin pressure, a rapid change in altitude or engine failure. It would provide the same information as an aircraft's black box, but in "live" real time.

"All of us are hoping to find a way to get the data on a black box sent to the ground before an airplane crashes," Sterbenz said. "Working with AMS, this may be a real possibility in the near future."