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The *SatNav News* is produced by the Navigation Programs AJM-32 branch of the Federal Aviation Administration (FAA). This newsletter provides information on the Global Positioning System (GPS), the Wide Area Augmentation System (WAAS) and the Ground Based Augmentation System (GBAS).

2003-2013
WAAS

10
years

Marking the
10th
Anniversary
of the
Commissioning
of WAAS
July 10, 2003

The WAAS Edition

WAAS Critical Tool for Northern Air Cargo Boeing 737s

Headquartered in Anchorage, Alaska, Northern Air Cargo (NAC) makes over 4000 flights annually to destinations in Alaska, Canada, and the "lower 48" states in the USA. NAC flies two Boeing 737-300s and three Boeing 737-200s, which are all Wide Area Augmentation System (WAAS) equipped. The cargo airline has over 300 employees, including 40 pilots.

NAC was the first Boeing operator in the United States to apply for and acquire a supplemental type certificate (STC) from the Federal Aviation Administration (FAA) to fly their fleet with full WAAS Localizer Performance with Vertical guidance (LPV) capability. NAC equipped three Boeing 737-200 planes with the Universal Avionics UNS-1Fw

("w" standing for WAAS) as part of a data collection project conducted by the FAA. NAC decided to also equip planes it subsequently added to its fleet after observing the benefits of WAAS during flight operations.

"WAAS has now become a critical tool in our toolbox," said David Karp, NAC President and Chief Executive Officer. "Since we have been operating the WAAS equipped

fleet, we have multiple examples where we have been able to get into a destination when others couldn't just because of the approach."

"We save about 200 lbs. of fuel on each one of these flights just with the ability to fly the precision approaches," said Mr. Karp. "It definitely converts to value for our customers."



Inside ...

- 1 WAAS Critical Tool for Northern Air Cargo Boeing 737s
- 2 Mercy One in Des Moines Adds Second WAAS Equipped Bell 429 Helicopter
- 2 PenAir in Alaska Equipping Fleet with WAAS
- 3 Horizon Air and WAAS
- 3 WAAS Gives Ryan Air of Alaska More Direct Routes, Lower Minimums
- 3 What's New on the Web
- 4 Satellite Navigation Approach Procedures Update

Tell Us Your WAAS Story

We're collecting testimonials about the benefits of Wide Area Augmentation System (WAAS) navigation from users. If you are a pilot, passenger, airport manager, airline employee, or are involved in aviation in any capacity - whether you fly fixed-wing or vertical flight aircraft - we want to hear from you! Please send your stories and contact information to Scott Speed at scott_ctr.speed@faa.gov

"In talking to other carriers, which we have, about the benefits of a WAAS installation and a WAAS equipped fleet, we tell them WAAS enables better reliability, saves fuel, improves safety and results in a better overall operation and delivery of product and services to your customers," said Mr. Karp.

- Scott Speed, FAA AIM-321/NAVITAC

Mercy One in Des Moines Adds Second WAAS Equipped Bell 429 Helicopter

In May, 2013, the Mercy One helicopter emergency medical service (HEMS) of Mercy Medical Center in Des Moines, Iowa added a second Wide Area Augmentation System (WAAS) equipped Bell 429 helicopter to its fleet. The Mercy Medical Center program, among the nation's first HEMS operations to gain approval for WAAS Instrument Flight Rules (IFR) navigation, now has three helicopters in service with bases in Des Moines, Knoxville, and Clarinda, Iowa. Mercy One has 43 dedicated full- and part-time staff among the three locations.

"Prior to WAAS approach capability here at the hospital, an Instrument Flight Rules (IFR) flight would require the pilot to land at the Des Moines International Airport approximately 7 miles away and meet with a ground ambulance to transfer the patient and crew to the hospital," said Dennis Cochran, Flight Program Manager for Mercy Medical Center. "That process would easily add an additional 30 minutes of time to the return leg of the transport. For time critical patients, those 30 minutes can be significant."

In February, 2012, the FAA approved a low-level helicopter route infrastructure in the greater Des Moines area, enabled by WAAS, that greatly expedites the operation of the Mercy One helicopter emergency medical service. Mercy One is able to reach any destination in Iowa within an hour.

"There are five WAAS approaches, including Mercy, located within the



low-level route structure or network," said Chuck King, lead pilot for Mercy One. "Three of them, other than Mercy, are WAAS approaches to hospital helipads. One of the approaches is to a helipad located on the west edge of the city of Stuart, IA. There is no hospital or clinic associated with this helipad; it is used as a rendezvous point for the helicopter and ground ambulances arriving from surrounding counties."

A Copter Point-in-Space RNAV Approach Procedure and an Obstacle Departure Procedure were designed for each of the five landing sites along with a low altitude IFR enroute structure to connect them. With the WAAS enabled Bell 429 helicopters, the approaches allow landings at these sites with visibilities as low as three quarters of a mile and with cloud ceilings as low as 300 feet.

"Another benefit of the WAAS approach and departure from the hospital is giving the pilot the ability to leave from Mercy in lower weather margins," said Mr. Cochran. "Prior to WAAS we missed many flights due to not being able to get out of the hospital helipad to initiate an IFR flight. The only solution was to move the aircraft and medical crew to the airport and stage out of the airport before weather conditions deteriorated to IFR

conditions. The practice of relocating the crew disrupted their ability to carry out hospital duties when not on medical missions because crew members were not at the hospital. At times overcast weather in Iowa could cause this relocation process to occur for extended periods of time."

The Mercy One team consists of registered nurses and paramedics experienced in trauma, cardiac, and critical care. A specialized neonatal team transport is also available when needed. Mercy One made over 1,000 patient flights in 2012.

- Scott Speed, FAA AIM-321/NAVITAC

PenAir in Alaska Equipping Fleet with WAAS

Headquartered in Anchorage, Alaska, PenAir flies 300,000 passengers a year and 10 million pounds of mail and freight. PenAir flies to 15 destinations in Alaska and three in the lower 48 out of Boston, Massachusetts. PenAir has 450 employees including 130 pilots.

PenAir flies fifteen SAAB 340s and is in the process of equipping its entire fleet with WAAS.

"WAAS has been tremendous to us," said Danny Seybert, CEO of PenAir, "because where we fly oftentimes if the land based navigation equipment fails there is no other way to shoot



an approach to get there to fix the equipment.”

“Without GPS-based technologies we would most likely revert to what we used to do which was make our own approaches based on non-directional beacons (NDBs), some of which may be a hundred miles away.”

- Scott Speed, FAA AJM-321/NAVTAC

Horizon Air and WAAS

On December 30, 2009, Horizon Air became the first Federal Aviation Regulation (FAR) Part 121 passenger carrier to fly revenue operations using the Wide Area Augmentation System (WAAS). Horizon originally equipped seven planes with WAAS avionics as part of a Federal Aviation Administration (FAA) data collection program. As a result of the accrued WAAS benefits, in 2012, management at Horizon decided to equip the entire fleet of 48 Bombardier Q-400 turboprop aircraft with the Universal UNS-1EW Wide Area Augmentation System (WAAS) Flight Management



System (FMS). As of June 2013, all aircraft in the Horizon fleet have been equipped with WAAS avionics.

Horizon Air, part of the Alaska Air Group, Inc., is headquartered at the Seattle-Tacoma International Airport (SEA) in SeaTac, Washington. Horizon Air has its Flight Operations and Maintenance Headquarters at Portland International Airport (PDX) in Portland, Oregon. The airline has over 3000 employees, including about 500 pilots, and flies over 7 million passengers a year.

Horizon saves approximately \$2 million per year due to improved efficiency and avoided costs with WAAS. This includes a fuel burn reduction of 50,000 gallons per year. “Horizon Air believes that satellite-based navigation brings a lot of advantages to the table,” Perry Solmonson, Horizon Air’s Director of Flight Operations. “The lower approach minimums and the safety of having vertical path guidance to the runway are great advantages. What we realized is that we could train one kind of approach with our crews instead of several different approaches. Training for our number of people is a big deal!”

“With WAAS, it is the first time, in the history of civil navigation anyway,” said Mr. Solmonson, “that we have a

means of flying area navigation with a primary means navigation system and that truly is a game changer.”

- Scott Speed, FAA AJM-321/NAVTAC

WAAS Gives Ryan Air of Alaska More Direct Routes, Lower Minimums

Ryan Air is primarily an all-cargo carrier flying four CASA 212-200 aircraft, a Shorts Skyvan, a Pilatus PC-12 and 12 Cessna 207 aircraft. The four CASA-212 aircraft, the Shorts Skyvan, and the Pilatus PC-12 are WAAS equipped.

Ryan Air transports 18.45 million pounds of mail and freight annually and provides scheduled cargo service to 72 bush communities throughout Western Alaska. It employs 105 team members, including 26 pilots.

“WAAS allows us greater accessibility to communities, improved medevac operations and decreased search and rescue costs,” said Wilfred P. Ryan, President of Ryan Air. “At communities where GPS or WAAS LPV approaches exist, our scheduled completion rates are much greater due to lower approach minimums.”



Ryan Air operates from seven hubs in Alaska (Kotzebue, Nome, Unalakleet, Emmonak, St. Mary’s, Aniak, and Bethel). Ryan Air also conducts scheduled passenger operations out of Aniak to six bush communities.

“I cannot quantify the annual savings that the WAAS infrastructure brings to our organization,” said Mr. Ryan, “but more direct routes and improved accessibility leads to greater customer satisfaction, lower costs, and increased safety.”

- Scott Speed, FAA AJM-321/NAVTAC

What's New on the Web!

Where can you find FAA Satellite Navigation Program information in between editions of the SATNAV News? Please visit our website - <http://gps.faa.gov>. Recently, we have added a new WAAS status briefing under the Satellite Navigation Library section; added the latest WAAS Quarterly Status Report; and posted updated numbers on WAAS approach procedure development. Also, on our website, you can find information about how GPS, WAAS, and Ground Based Augmentation System (GBAS)

work; an archive of past SATNAV News editions; and fact sheets. We are always looking for ways to improve the website and love your suggestions, so please feel free to send them to MaryAnn.CTR.Davis@faa.gov. In the meantime, we are working on major updates to many of the existing pages. More on that in the next SATNAV News!

Satellite Navigation Approach Procedures Update

For more detailed information

about satellite based instrument approach procedures, please visit our GPS/WAAS Approach Procedures page at http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/gnss/approaches/index.cfm.

- Mary Ann Davis, FAA A/JM-321/NAV/TAC

Satellite-based Approach Procedures (by Procedure Type)			
	Procedures (Part 139 Airports)	Procedures (Non-Part 139 Airports)	Total Number of Procedures
LNAV Procedures	1,782	3,916	5,698
LNAV/VNAV Procedures	1,314	1,722	3,044
LPV Procedures (LPV w/200' HAT)	1,327	1,833	3,160 (815)
LP Procedures	60	374	434
GLS Procedures	11	0	11
GPS Stand-Alone Procedures	12	147	159

Note: Number of GPS Stand-Alone will continue to decrease as they are replaced by RNAV procedures
(Data as of June 27, 2013)

Instrument Approach Procedures (IAPs) Based on Conventional NAVAIDS	
ILS	1,283
ILS (CAT II)	156
ILS (CAT III)	117
NDB	806
VOR	1,291
VOR / DME	948

(Data as of May 21, 2013)

More information is available at https://www.faa.gov/air_traffic/flight_info/aeronav/procedures/ifp_inventory_summary/