



International Civil Aviation Organization

**FIFTEENTH MEETING OF THE
COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND
METEOROLOGY SUB-GROUP (CNS/MET SG/15) OF APANPIRG**

Bangkok, Thailand, 25 – 29 July 2011

Agenda Item 6: Surveillance

3) discuss other surveillance related issues

AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B)

(Presented by the United States of America)

SUMMARY

The Surveillance and Broadcast Services (SBS) office has been moving forward with the ADS-B implementation for both air traffic control (ATC) separation services (also known as ‘ADS-B critical services’) and the up-linking of Traffic Information Services - Broadcast (TIS-B) and Flight Information Services – Broadcast (FIS-B) to properly equipped aircraft (also known as ‘ADS-B essential services’). The FAA commissioned ADS-B traffic and weather services in 2008 and these services are available now, *free*, to anyone flying over coverage areas. The agency is continuing to work with general aviation (GA) airports to provide these services. Traffic and weather services are available now to properly equipped aircraft in various portions of the United States.

There will be ADS-B coverage approximately everywhere there is radar coverage today by 2013.

This paper relates to –

Strategic Objectives:

A: Safety – Enhance global civil aviation safety

Global Plan Initiatives:

GPI-12 Functional integration of ground systems with airborne systems

GPI-16 Decision support systems and alerting systems

GPI-17 Data link applications

GPI-21 Navigation systems

1. Introduction

1.1 The program identified key sites for ADS-B services, as shown below.

1.1.1 Southern Florida. The program office completed the implementation and commissioning, also called the In Service Decision (ISD), of essential services in southern Florida in November 2008. This provides properly equipped aircraft with TIS-B and FIS-B information. The ISD decision cleared the way for the vendor (ITT) to install ground stations and transmit broadcasts for operational use across the nation, starting on the East and West Coasts and portions of the Midwest and moving to the interior of the country. Approximately 300 ground stations are installed across the National Airspace System today. A total of 321 ground stations are scheduled to be installed later this year. Radio station deployment will be completed across the NAS, approximately everywhere there is radar coverage, by 2013

Radio Stations Deployment Status as of July 2011

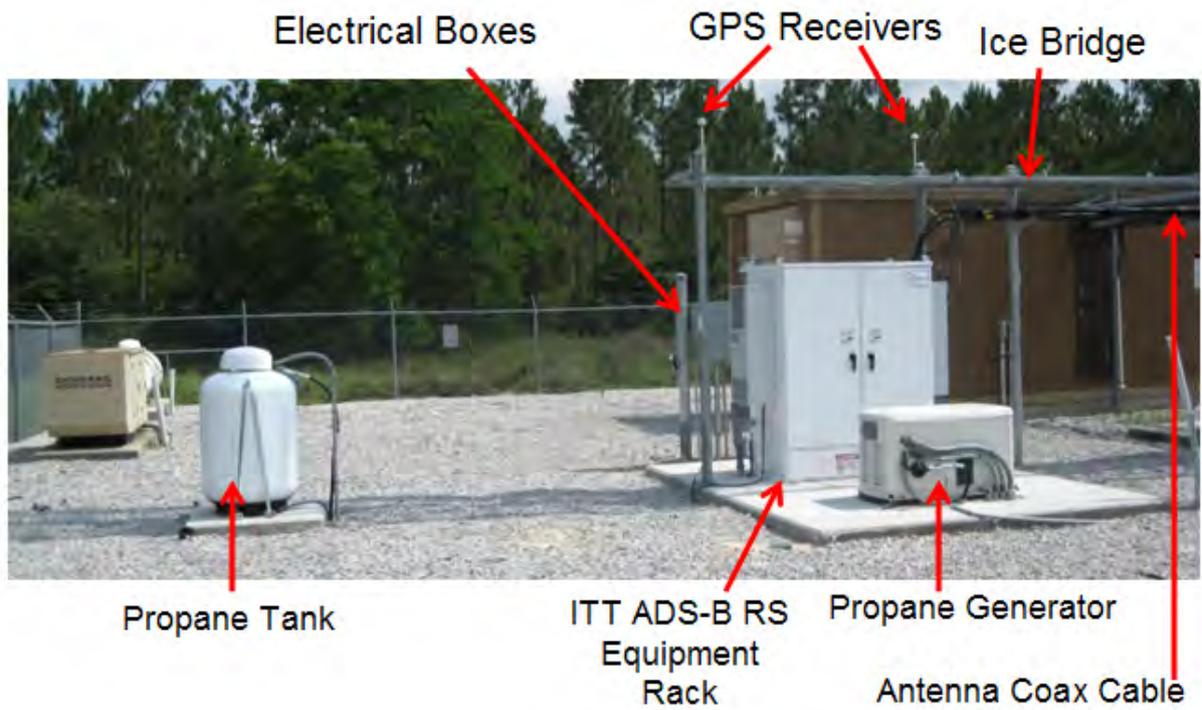


- Year-End Plan for 2011 – 410 Radio Stations Reporting on the SBS Network (377 in CONUS; 33 AK)
- 352 Radio Stations Constructed (323 in CONUS; 29 in Alaska)
- 346 Radio Stations Reporting on the SBS Network (317 in CONUS; 29 in AK)
- 79 Radio Stations Under Construction or in Final Design (75 in CONUS; 4 in AK)
- 34 IOC Service Volumes comprised of 280 IOC Radio Stations

Sample Radio Station Site



Typical Radio Site Equipment



1.1.2 Louisville, Kentucky. Louisville Terminal Radar Approach Control (TRACON) was chosen as one of the key sites for ADS-B critical services due to UPS voluntarily equipping with ADS-B capable avionics. The Initial Operating Capability (IOC) was achieved in November 2009.

1.1.3 Gulf of Mexico / Houston Center. The Gulf of Mexico was chosen as another key site due to the agreement with the Helicopters Association International (HAI) and the oil and gas industry partners. The platform owners provided space for the FAA to deploy ADS-B radio stations while operators would provide transportation and equip with proper avionics. IOC at Houston Center was achieved in December 2009.

1.1.4 Philadelphia, PA. Philadelphia TRACON and Philadelphia Tower are receiving ADS-B services. This is the first site to integrate with the Airport Surface Detection Equipment – Model X (ASDE-X) system for ADS-B surface surveillance. The IOC was reached in March 2010.

1.1.5 Juneau, Alaska. Anchorage Center is now separating aircraft flying in and around the Juneau area using ADS-B data. The program office reached IOC in April 2010.

1.2 The Air Traffic Organization (ATO) and the Office of Aviation Safety (AVS) approved the ADS-B In-Service Decision (ISD) for ATC separation services in September, 2010. This milestone enables the use of ADS-B information as a qualified surveillance source to provide ATC services throughout the NAS. ATC will use ADS-B surveillance information in the same manner as current dependent /cooperative surveillance system information is used, i.e., to assist aircraft with navigation, to separate aircraft, and to issue safety alerts and traffic advisories. ADS-B will be used to enhance surveillance information for ATC automation system functions.

1.3 ADS-B has been adapted to four of the FAA's current automation platforms and is slated to become operational on the En Route Automation Modernization (ERAM) system, the replacement for the HOST system, in the summer of 2011 at the Houston air route traffic control center.

Furthermore, the agency is expected to reach Initial Operating Capability (IOC) at New York Terminal Radar Approach Control this year (2011) for ADS-B surveillance services. This will support the following airports:

1. John F. Kennedy International Airport (JFK)
2. LaGuardia Airport (LGA)
3. Newark Liberty International Airport (EWR)
4. Long Island MacArthur Airport (ISP)
5. Stewart International Airport (SWF)

The FAA is planning to declare Initial Operating Capability (IOC) on the Standard Terminal Automation Replacement System (STARS) in FY 12 for the following sites:

1. Jacksonville, FL
2. Miami, FL
3. Seattle, WA
4. Orlando, FL
5. Phoenix, AZ
6. Windsor Locks, CT (Bradley International Airport)
7. Pittsburgh, PA
8. Tampa, FL
9. Daytona Beach, FL
10. Pensacola, FL
11. Corpus Christi, TX
12. San Antonio, TX
13. El Paso, TX
14. New Orleans, LA

There will potentially be six sites to reach Initial Operating Capability (IOC) in fiscal year (FY) 2012 for En Route Automation Modernization (ERAM)

1.4 The ADS-B final rule was published in May 2010 and mandates performance requirements for ADS-B avionics that will be required to fly in certain airspace. The ADS-B rule requires aircraft to be equipped by 2020 to transmit “ADS-B Out” to fly in certain airspace—generally the same busy airspace where transponders are required today. (ADS-B Out transmits location information received from the Global Navigation Satellite System (GNSS) out of the aircraft to ADS-B ground stations and to other aircraft equipped to receive ADS-B broadcasts). Equipage for “ADS-B In” to receive free traffic and weather services is voluntary. The agency will continue working with the aviation community to determine whether or not to proceed with a possible “ADS-B In” mandate. The rule does not preclude other navigation source methods. This rule does not mandate ADS-B In, however an Aviation Rulemaking Committee (ARC) was chartered the summer of 2010 and continues to meet on a regular basis to address the ADS-B In strategy. They will have a final report September 30, 2011 and a detailed recommendation for next steps by June 2012.

1.5 Concurrent to the deployment and implementation of ADS-B, the agency signed agreements with several airlines (JetBlue, United and US Airways). These agreements are set up to demonstrate the benefits of advanced ADS-B applications and procedures during revenue service. The operational evaluations will give the agency detailed cost and benefit data, and encourage airlines to equip early to capitalize on ADS-B benefits.

The development of future applications are continuing with the following applications:

1. Ground-Based Interval Management – Spacing development and deployment
2. Flight Deck Based Interval Management-Spacing flight trials
3. Traffic Situation Awareness with Alerts flight tests

The FAA is set this summer to start operational flight evaluations using In Trail Procedure application on revenue flights. Under an agreement with the FAA, United Airlines agreed to equip 12 of its Boeing 747s with the equipment necessary to perform ITP. Data captured during regularly scheduled revenue flights between the U.S. West Coast and Australia starting this summer and continuing for a year will validate operational performance and prove ITP’s economic advantages. Other partners on the ITP project include Honeywell, Goodrich, Airservices Australia, and Airways Corp. New Zealand.

2. Discussion

2.1 There are a number of countries exploring ADS-B infrastructure and potential regulatory efforts to require ADS-B on aircraft in controlled airspace.

2.2 The FAA remains committed to maximizing the interoperability of avionics capability between air navigation service providers (ANSPs). This would include reducing the complexity of operations and allowing carriers to operate in different markets with the same level or performance.

2.3 The FAA wishes other countries consider that assuming requirements based only on minimum performance for five (5) mile separation in non-radar airspace and against older standards would limit ADS-B benefits and services. In order to minimize the aircraft retrofit costs and complexity risks, countries should consider the benefits possible with ADS-B in three (3) mile terminal operations, airport surface operations and especially the numerous and highly beneficial ADS-B In applications. These operations would have both safety and efficiency gains.

2.4 It is important that various countries consider the total benefits that are gained from ADS-B before publishing any regulations or requirements. The FAA has shared its position and data through the Requirements Focus Groups and in RTCA and EUROCAE documents.

2.5 The FAA Final Rule and standards (most notably DO-260B) provide the maximum benefits possible for all of these applications (ADS-B In) as they are known today. They set the requirements to the minimum level required by the FAA safety analysis. These requirements allow for safe operations and minimize the risks of requiring aircraft upgrades later as new benefits and applications are approved. Through the working groups, the FAA Surveillance and Broadcast Services office will continue to provide general information to members. Also, the FAA is willing to enter into agreements for more detailed studies to review operational, scientific and economic analysis necessary for decision making regarding implementation of ADS-B.

3. Action by the meeting

3.1 The FAA continues to work with all areas of industry to ensure current program information is readily available.

3.2 The SBS Program Office continues to work on Pilot Advisory and ATC Separation Services rollout, ADS-B In applications development, aircraft and avionics manufacturers, operators, states and countries to explore successful agreement implementation to accelerate ADS-B benefits.
