

STATEMENT OF VINCENT CAPEZZUTO, DIRECTOR OF SURVEILLANCE AND BROADCAST SERVICES PROGRAM OFFICE, EN ROUTE AND OCEANIC SERVICES, AIR TRAFFIC ORGANIZATION, FEDERAL AVIATION ADMINISTRATION, BEFORE THE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON AVIATION ON NEXTGEN: THE AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST CONTRACT, ON OCTOBER 17, 2007.

Chairman Costello, Congressman Petri, Members of the Subcommittee:

Thank you for holding today's hearing on the Federal Aviation Administration's (FAA) contract for the Automatic Dependent Surveillance-Broadcast (ADS-B) system. My name is Vincent Capezzuto, and as the Director of Surveillance and Broadcast Services in the Air Traffic Organization at the FAA, I have responsibility for oversight of this performance based contract. ADS-B is a new service for the FAA and this vehicle will allow the FAA to deploy the equipment and service far more quickly and easily than traditional methods, which in turn will increase efficiency and capacity in the National Airspace System (NAS), and most important, enhance aviation safety.

As you know, this system is vital to building the Next Generation Air Transportation System (NextGen). In order to ensure the success of ADS-B while maintaining the safest aviation system in the world, the FAA has crafted an innovative and closely monitored contract with the ITT Corporation for the development of ADS-B. We appreciate the role that Congress has already played in developing this contract. In fact, our confidence in the contract is directly due to Congress' oversight and input, as well as contributions from other government entities, which have been invaluable to this process. We

welcome the Members' continued oversight to help us manage the contract moving forward.

ADS-B: Description and Benefits

While some of the Members have been able to see ADS-B in action, I wanted to give some brief background as to ADS-B's capabilities and how it fits into the FAA's longer-term NextGen goals. ADS-B uses signals from the international Global Navigation Satellite System to provide air traffic controllers and pilots with much more accurate information that will help keep aircraft safely separated in the sky and on runways. Aircraft avionics receive satellite signals and transmit the aircraft's precise locations to air traffic controllers and pilots. The avionics convert that position into a digital code and combine it with other unique data from the aircraft's flight monitoring system — such as the type of aircraft, its speed, its flight number, and whether it is turning, climbing, or descending. The code containing all of this data is automatically broadcast from the aircraft's avionics once a second or more, as compared to the current five to twelve second refresh from today's radar. While a time savings of four to eleven seconds may seem brief to some, this savings actually allows for far greater accuracy in determining aircraft position.

ADS-B equipped aircraft as well as ADS-B ground stations up to 200 miles away from the originating ADS-B aircraft will receive these broadcasts. Air traffic controllers will see the ADS-B surveillance information on displays they are already using, so little additional training will be needed for the controller workforce. The ADS-B ground

stations also transmit data to aircraft. These stations send radar-based targets for non-ADS-B-equipped aircraft up to ADS-B equipped aircraft — this function is called Traffic Information Service-Broadcast (TIS-B). ADS-B ground stations also send out textual and graphical information and forecasts from the National Weather Service and flight information, such as Notice to Airmen or temporary flight restrictions — this is called Flight Information Service-Broadcast (FIS-B). Pilots can see the ADS-B, TIS-B and FIS-B information on their certified cockpit traffic display screens.

When properly equipped with ADS-B, both pilots and controllers will, for the first time, see similar real-time displays of air traffic. Pilots will have much better situational awareness because they will know with greater accuracy where their own aircraft are, and their displays will show them all the aircraft in the air and on the ground around them. Pilots will be able to have better situational awareness of other aircraft with fewer instructions or advisories from ground-based controllers. At night and in poor visual conditions, pilots will also be able to see where they are in relation to the ground using on-board avionics and terrain maps. In addition to improved safety in the sky, ADS-B can help reduce the risk of runway incursions. Both pilots and controllers will see the precise location on runway maps of each aircraft and equipped ground vehicles, along with data that shows where they are in relation to each other. These displays are clear and accurate, even at night or during heavy rainfall.

ADS-B also has the potential to increase capacity significantly, because more accurate tracking using satellite based positioning means aircraft will be able to fly safely with less

distance between them. Because the better accuracy available with ADS-B also means greater predictability of aircraft movement, air traffic controllers will be able to manage the air traffic arriving and departing from congested airports with greater precision, resulting in even more gains in efficiency. Eventually, with ADS-B, we envision that pilots can play a more active role in keeping safe distances between aircraft, if they have the certified displays on the aircraft pinpointing all the air traffic around them, along with local weather displays.

Although radar technology has advanced, it is essentially a product of World War II technology. Radar occasionally has problems discriminating airplanes from migratory birds and rain “clutter.” Secondary surveillance radar systems can determine the identity of the aircraft because they interrogate transponders on-board the aircraft; however, both primary and secondary radars are very large structures that are expensive to deploy, need continuous maintenance, and require the agency to lease large plots of land on which to situate them. ADS-B, on the other hand, does not have problems with clutter because it receives data directly from aircraft transmitters rather than passively scanning for input like radars do. Also, ADS-B provides superior accuracy and timeliness of information in comparison to secondary radars. ADS-B ground stations are inexpensive compared to radar, and are the size of mini-refrigerators that can go essentially anywhere, so they minimize the required real estate. In addition, ADS-B also provides greater coverage, since ADS-B ground stations are much easier to place than radar. Remote areas where there is currently no radar, such as the Gulf of Mexico and parts of Alaska, will have precise surveillance coverage with ADS-B.

The ADS-B Contractor: ITT Corporation

As you know, in August 2007, the FAA selected ITT Corporation as the prime contractor for the development and deployment of ADS-B. The contract requires ITT to have the system ready for use by 2010 and expand coverage nationwide by 2013. The first stage of the contract is worth \$207 million, with options worth an additional \$1.6 billion. With a system as important as ADS-B, and the price tag that comes with it, we want to make sure that we are working responsibly with the taxpayers' dollars.

The FAA believes that we have a strong contract in place and that ITT, as a proven systems architect and integrator, has the experience and expertise to fulfill that contract. The ITT team has deployed ADS-B equipment for use in aircraft separation in Australia and has worked with the FAA previously on the Telecommunications Engineering Operations and Management contract. Additionally, the contract accounts for risk mitigation, which requires ITT to work with the FAA to identify any risks within the program along with applicable mitigation plans to execute together in partnership.

To help achieve the goals of the contract, ITT has a team of subcontractors that includes:

- AT&T – to create, manage and secure our telecommunications networks and infrastructure;

- Thales North America (formerly Wilcox Electronics, which provided most of FAA's instrument landing systems) – to provide expertise as a leading provider of ADS-B ground stations;
- WSI – to continue as a trusted weather provider to the FAA;
- SAIC – to provide scientific, engineering, systems integration, and technical services and solutions;
- PriceWaterhouseCoopers – to validate and support the business aspects of the contract;
- Aerospace Engineering – to provide prototyping and metrics of the benefits of ADS-B-enabled systems, operational procedures, and air traffic control (ATC) concepts;
- Sunhillo – to help integrate ADS-B information seamlessly into the NAS with existing and future automation systems;
- Comsearch – to perform radio frequency interference and coverage analysis for ADS-B;
- Mission Critical Solutions of Tampa – to assemble ADS-B equipment racks and perform critical field installations; and
- Pragmatics, Washington Consulting Group, Aviation Communications and Surveillance Systems (ACSS), and NCR Corporation.

These corporations provide additional and complementary expertise and capabilities to ITT's core abilities in aviation, avionics, and service maintenance. In addition, ITT has partnered with L-3 Avionics Systems and Sandia Aerospace to develop low cost avionics

for ADS-B and secondary radar transponders. We believe that these strategic partnerships will result in a better product that is seamlessly and reliably integrated into the NAS while providing increased capacity, enhanced services, and maximum benefits for aviation safety.

The ADS-B Contract: Milestones and Safeguards

As mentioned above, ADS-B is a serious investment. In order to protect that investment, we have designed the contract to include several required milestone events that will help us track progress and test the system as each piece is completed. Further, we have created additional incentives and disincentives throughout the contract to maximize the contractor's commitment to success. Finally, we have a building block plan for the contract; first we build, then we test, while we create the appropriate procedures for use, and only after the groundwork has been laid do we deploy the technology nationwide.

We are keenly aware of the risks inherent to new technology and new procedures, and we are safeguarding against them as best we can. ADS-B's potential is enormous; it is integral to our ability to achieve NextGen and to handle the doubling of today's air traffic predicted by 2025. But, we do not want to oversell these capabilities, and the only way we can present a realistic picture of our goals is to double-check our accomplishments along the way.

Just this month, we achieved a major goal for our ADS-B program, by publishing a Notice of Proposed Rulemaking that allow only aircraft equipped with ADS-B avionics

to access certain controlled-airspace. Equipage of aircraft is obviously essential to the FAA's future ability to perform applications such as self separation of aircraft as well as encourages ITT to develop cost-effective hardware to maximize its investment. We anticipate a Final Rule will be issued in late 2009.

Currently, we are targeting the following goals:

- Testing ground infrastructure and continuing voluntary avionics equipage by April 2008;
- Rolling out initial operating capability by October 2009;
- Deploying NAS-wide ground infrastructure between 2010-2013;
- Completing avionics equipage between 2010-2020.

We have set "default" milestones for key accomplishments in the contract; if the contractor is unable to achieve the milestones, the FAA may consider it in default of the contract, and may cancel the remainder of the contract. With the first milestone set for May 2008, when the contractor is to test the up-linking of traffic and weather information to pilots (Key Site Initial Operating Capability). With this aggressive timeline, it is clear we are not wasting any time in requiring our contractor to deliver. Additional milestones are set for March, April, June, August, and October of 2009. These milestones give us concrete measures of the contractor's progress and, if needed, allow the FAA to adjust the program early on or redirect resources as needed. Our goal is not only to test technical performance, but also to test business performance.

Other oversight measures include preliminary design reviews and critical design reviews, which enable us to track the contractor's progress and success. As previously mentioned, we also have risk mitigation built into the contract, which requires ITT's full participation. By no means is the FAA a passive entity in this contract.

As noted above, some of the major incentives for our contractor are embedded in the additional \$1.6 billion options that the FAA can choose to exercise or not. Depending on proven contractor performance or if FAA does not receive the benefits anticipated in a particular area, these options would allow the FAA to unilaterally stop the contract in whole or in part. Additionally, the contractor is allowed, *subject to FAA approval*, to develop the data for other aeronautical uses, which would result in a reduction of the cost of the contract to the FAA while allowing the contractor to recoup its investment.

We are confident that this system of "carrots and sticks" will afford the FAA considerable oversight of the contract, encourage the contractor to excel in performance, and allow seamless integration of this important new technology. The contract is structured to place responsibility and ownership of hardware with the contractor or other third parties, thus ensuring long-term buy-in by the contractor and the industry, while the FAA retains control over system performance and data transmitted. The FAA also retains ownership and control of the "paper design" of the system as reflected in the final design review and any subsequent activities that might impact the design or the safety and security of the system. Finally, all data will be certified by the FAA, to guarantee its integrity prior to use for air traffic control purposes. FAA is a safety oversight agency

first and foremost, and the certification of the data is critical to our mission to ensure safety is maintained and enhanced for the flying public.

The ADS-B User Community

A necessary component of all our planning and efforts has been the input of the ADS-B user community – the pilots, the controllers, the airlines, the engineers, the manufacturers – all the interested stakeholders have a place at the ADS-B table.

The FAA has formed the Air Traffic Management Advisory Management Committee (ATMAC) ADS-B Work Group, which includes representation from government and industry, including the Air Transport Association, the Air Line Pilots Association, and Helicopter Association International, to name a few. The objective of the Work Group is to collaboratively plan and expedite NAS-wide implementation of ADS-B and to offer solutions to implementation issues.

Further, we have formed an Aviation Rulemaking Committee (ARC) to assist the agency in coordinating responses to the previously mentioned NPRM. In addition, the ARC was formed to help us encourage avionics equipage even before the rule's compliance date to speed the safety and efficiency gains possible with ADS-B. ARC participants include many of the same participants from the ADS-B Work Group, as well as the General Aviation Manufacturers Association, the Department of Defense, the National Air Traffic Controllers Association, as well as many others. Now that the NPRM has been

published, the ARC will make specific recommendations to the FAA concerning the proposed requirements, based upon comments received in response to the NPRM.

Stakeholder participation is vital to the success of the ADS-B contract and overall program. We are committed to continuing to receive input from the aviation community in order to create a better service product and optimize the ways that service is applied. In that vein, we welcome Congress' continued interest in and oversight of this program; we have already made good use of your input in framing our issues and addressing our shared concerns.

Mr. Chairman, this concludes our prepared statement. We would be happy to answer any questions that you or the other Members of the Committee may have.