
Office of Inspector General

Audit Report

FAA OVERSIGHT IS KEY FOR CONTRACTOR-OWNED AIR TRAFFIC CONTROL SYSTEMS THAT ARE NOT CERTIFIED

Federal Aviation Administration

Report Number: AV-2011-149

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Memorandum

U.S. Department of
Transportation

Office of the Secretary
of Transportation
Office of Inspector General

Subject: INFORMATION: FAA Oversight Is Key for
Contractor-Owned Air Traffic Control
Systems That Are Not Certified
Federal Aviation Administration
Report Number AV-2011-149

Date: August 4, 2011

From: Jeffrey B. Guzzetti 
Assistant Inspector General
for Aviation and Special Program Audits

Reply to
Attn. of: JA-10

To: Federal Aviation Administrator

The Federal Aviation Administration's (FAA) certification process is an integral quality control method to ensure that air traffic control systems, subsystems, and services directly affecting the flying public are safe and function as intended. FAA has historically owned and operated all key air traffic control (ATC) systems in the National Airspace System (NAS) but has transitioned more of them to the private sector in recent years. In 2007, FAA revised its certification policy to require Agency certification for FAA-owned, but not contractor-owned, systems.

Given this policy shift, the former Chairmen of the House Committee on Transportation and Infrastructure and Subcommittee on Aviation requested that we assess the impact of the certification change on FAA's overall responsibility for maintaining the safety and integrity of key NAS systems. Specifically, they cited concerns that this change could reduce FAA's visibility into the quality and performance of these systems. For example, while FAA will use the Automatic Dependent Surveillance - Broadcast (ADS-B) system¹—which is expected to be a cornerstone of the Next Generation Air Transportation System (NextGen)—for moment-by-moment control of aircraft, FAA will not certify the system's contractor-owned ground infrastructure. Accordingly, our objectives were to (1) assess the impact of FAA's revised certification policy on the safety and integrity of air traffic control systems, such as ADS-B, and (2) identify

¹ ADS-B is a satellite-based surveillance technology that is designed to supplement radar, using aircraft avionics and ground-based systems to provide information on aircraft location to pilots and air traffic controllers.

vulnerabilities that FAA faces in relying on private sector ownership of key air traffic management systems.

We conducted this performance audit in accordance with generally accepted government auditing standards. Exhibit A details our scope and methodology, and exhibit B lists facilities visited or contacted.

RESULTS IN BRIEF

FAA is gaining insight from its experience using monitoring rather than certification to ensure the ADS-B ground infrastructure meets FAA's standards. Therefore, FAA's justification for this decision is not fully developed, and as such, we could not fully assess the outcomes of FAA not certifying contractor-owned systems. Regardless, the outcomes are of critical importance because FAA is solely responsible for maintaining the safety and integrity of the NAS. In the case of ADS-B, FAA has developed an active monitoring system called the Surveillance and Broadcast Service (SBS) monitor that is intended to help FAA ensure the ground equipment at each individual ADS-B site is working. There are risks with this oversight approach. In particular, FAA has not developed automated means and procedures to analyze the large amount of performance data that the SBS monitor generates or assigned sufficient staff to do the analyses. Also, FAA has not ensured the network design for the SBS monitor works as intended and is a reliable tool that can help FAA avoid and resolve outages.

As FAA shifts from operating its own systems to overseeing contractor-owned and -managed systems, the Agency is vulnerable to losing long-term visibility into NAS system performance. While the SBS monitor may prove a viable alternative to certification for ADS-B, it is unique in the NAS. FAA does not formally require such a monitoring capability for all NAS systems regardless of ownership and instead makes this decision on a case-by-case basis for contractor-owned systems. These systems, however, will be a large part of the NAS and, as such, FAA's inconsistent application of its own quality standards, such as remote monitoring, poses a risk of inadequate performance. A second vulnerability facing FAA, as more contractor-owned systems are allowed into the NAS, is inadequate logistics support. Contractor oversight is resource intensive, and FAA will need assurance that contractor systems meet FAA reliability standards. However, FAA has serious shortfalls in logistics personnel—a critical concern since we found that FAA's logistics staff provide significant technical expertise and oversight of the contractor-owned ADS-B equipment and networks. Securing this expertise is especially vital in cases where FAA must assume greater control, especially when the contractor has inadequate logistics and maintenance support, which has occurred in the past.

We made six recommendations to FAA to address immediate risks with an independent monitoring capability and potential vulnerabilities as the Agency becomes more reliant on contractor-owned NAS systems. FAA concurred with all of our recommendations, but we have requested that the Agency clarify its response for two of them.

BACKGROUND

FAA maintains a comprehensive certification process designed to ensure that all NAS systems, subsystems, and services work safely.² According to FAA, certification is a quality control method used by the Air Traffic Organization's Technical Operations staff to ensure NAS systems and services are performing as expected.³ FAA certification encompasses several "levels"⁴ and is accomplished by having a credentialed⁵ FAA technician check and test systems or pieces of equipment on a periodic basis to ensure that they can be safely operated or returned to service and will not negatively impact any aspect of the NAS. FAA has criteria for determining which NAS systems and services require certification.⁶ The criteria dictate that certification is required if a NAS system provides any of the following:

- Moment-by-moment positional information to pilots or Air Traffic personnel during aircraft operations or communications control during these operations
- Essential meteorological information for aircraft taking off and landing
- Decision support information that could directly affect aircraft heading, altitude, routing, control, or conflict awareness

In September 2007, FAA revised its certification procedures to clarify that only "FAA-owned or -maintained NAS systems" must be certified. Previously, FAA did not specify ownership or maintenance responsibility as a specific requirement for certification. According to FAA, the revision to its certification procedures was made due to the 2005 transfer of FAA's flight services operations to Lockheed-Martin (except those provided by FAA-owned and maintained systems

² FAA's legal authority for certifying systems is Title 49, U.S.C. Sec. 44502, which states the FAA Administrator may (a) acquire, establish, improve, operate, and maintain air navigation facilities and (b) provide facilities and personnel to regulate and protect air traffic. FAA's certification process is described in Order 6000.15E.

³ FAA Order 6000.30D, "National Airspace Maintenance Policy."

⁴ Every higher level encompasses the levels below it. *Equipment* is the lowest, then *Sub-System*, *System*, and finally *Service*, which is the highest level of certification.

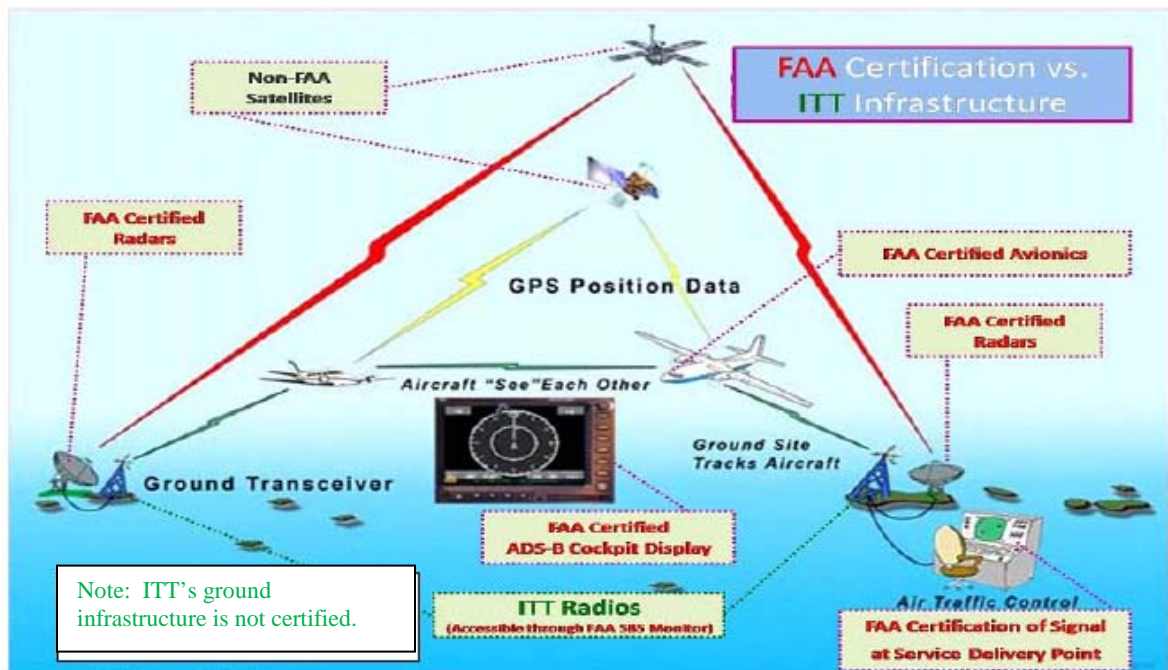
⁵ FAA issues certification credentials to individuals who have attained a professional level and are responsible for the operation and performance of air traffic control facilities. The credentials process is a confirmation that the individual possesses the knowledge and skills to assume responsibility for the operations of a service, system, or subsystem.

⁶ FAA Order 6000.15E, "General Maintenance Handbook for NAS Facilities."

in Alaska) under the FS-21 contract.⁷ However, FAA did not formally implement the policy change until 2007, soon after the Agency awarded a service-based contract to ITT for ADS-B. Under the contract terms, the Agency will own ADS-B surveillance data transmitted, and the design and configuration of the system, but ITT will own the hardware and ground infrastructure used to transmit the signal to FAA's air traffic control facilities.

In applying the revised procedures to ADS-B, FAA will certify the ADS-B data provided by avionics on ADS-B-equipped aircraft and at the FAA facilities using or routing the ADS-B data⁸ (see figure 1 below). However, FAA will not certify the hardware components that make up ITT's ground system.

Figure 1. FAA Depiction of ADS-B Service Certification



Source: OIG, based on a graphic by FAA

FAA states that it will certify ADS-B data similarly to how it certifies radar data. According to FAA, the ADS-B signal contains electronic metrics intended to assure accuracy and integrity through continuous automatic monitoring; therefore, FAA maintains it does not need to certify ITT's ground infrastructure that transmits the data.

⁷ Flight service stations provide aeronautical information, such as weather briefings, flight planning assistance, and aeronautical notices. In 2005, FAA awarded a contract to Lockheed Martin to provide flight services under the Flight Services-21 (FS-21) program. See OIG Report Number AV-2007-048, "Controls Over FAA's Conversion of Flight Service Stations to Contract Operations," May 18, 2007. OIG reports are available on our Web site: <http://www.oig.dot.gov/>.

⁸ FAA's certification process includes certification of avionics in accordance with Technical Standard Orders and Advisory Circulars and technician certification at the automation platform.

MONITORING RATHER THAN CERTIFYING AIR TRAFFIC CONTROL SYSTEMS SUCH AS ADS-B PRESENTS RISKS

FAA's decision to require certification only for FAA-owned, not contractor-owned systems did not change the Agency's responsibility for the safety and integrity of the NAS. However, it is too early to gauge the full impact of this decision because FAA is only in the early stages of its experience with systems, such as ADS-B, that are not certified under this new approach. FAA uses an automation tool, the SBS monitor, to alert FAA if ADS-B components are unreliable for managing air traffic due to outages or discrepancies. Tests of the monitor indicate it aids FAA's oversight of ADS-B's performance, but there are risks with this approach that FAA has not addressed and that will be especially important if it decides to use similar tools to oversee other contractor-owned systems. First, only a fraction of the 800 planned ADS-B ground sites are operational. Yet, the SBS monitor is already generating more performance data than the assigned FAA staff have time to analyze. Further, FAA is still developing automated means and procedures for such data analysis. Second, the ADS-B contractor is still implementing a remediation plan in response to an 11-hour ADS-B outage last summer that affected air traffic over the Gulf of Mexico and disabled the SBS monitor. This outage highlights FAA's dependency on the monitor for visibility into the ADS-B network's operational status. Consequently, the effectiveness of FAA's contractor oversight using monitoring in lieu of certification will only be as reliable as the monitoring tools FAA develops and deploys.

FAA Has Limited Experience With the SBS Monitor and Lacks Means To Analyze the Performance Data

Early tests of the SBS monitor indicate it will aid FAA's oversight of ADS-B system performance. However, FAA has limited experience overall with the monitor. As of late April 2011, the monitor was covering 335 of the approximately 800 transceivers ITT intends to deploy nationwide. Moreover, the Agency has yet to develop a means to analyze the extensive volume of performance data the monitor generates or assign sufficient staff for that purpose. Until FAA addresses these issues, it is not clear whether FAA's monitoring plan will be sufficient to actively monitor all 800 ADS-B ground transceivers, once deployed, to ensure FAA's requirements are being met.

FAA has installed two SBS monitors at a cost of \$10.4 million: one at the FAA Technical Center in Atlantic City, NJ, and one at the FAA Aeronautical Center in Oklahoma City, OK. Originally, FAA planned to deploy more than 20 monitors, but based on a cost-benefit analysis, FAA decided to deploy just the 2 systems. During actual testing, we observed that the SBS monitor: 1) displayed known out-of-service transceiver sites in Alaska—depicting the “red alert” status for

non-functioning equipment and providing green indications for functioning equipment—and 2) allowed continuous “24/7” automated coverage that is not possible through periodic site visits by a certified technician.

While these tests showed that the SBS monitor is useful, it is important to note that the SBS monitors convey a large amount of information about the ADS-B system that requires FAA to commit both staff resources and develop procedures for analyzing this information. Specifically, each monitor displays graphics and text (see figure 2 below) showing the status of ITT’s ground transceivers. This information is intended to provide FAA personnel with enough detail to examine component performance within each of ITT’s transceiver stations and help assess whether the contractor is meeting contract specifications.

Figure 2. SBS Monitor Displaying ADS-B Transceiver Station Data



Source: OIG picture at Oklahoma City, OK

However, FAA has yet to develop automated analyses capabilities for the performance data or procedures for analyzing and using the performance data collected from each site to help verify the reliability of the ADS-B ground system components. After the first 83 ground stations were deployed, the monitoring system was already generating 1,100 pages of data per month on the reliability of individual system components. Moreover, according to FAA officials responsible for the design and deployment of the SBS monitor, four staff are required to analyze the data that the monitor delivers, but only two have been assigned despite requests to the program office for additional resources. In sum, the SBS tool will not be a fully effective monitor of the ADS-B system without procedures and capabilities in place to analyze the system’s data. This will be further exacerbated

given the massive increase of data that will come with full deployment of 800 ground stations.

The SBS Monitor Proved To Be Unreliable During an ADS-B Network Outage, Validating Risks

According to FAA, the data from the SBS monitor are essential to verify whether FAA can rely on the ADS-B ground system and identify trends in performance. However, relying on these data also presents risks, particularly in light of the monitoring system's vulnerability to network failure. During an August 2010 ADS-B network outage, the SBS monitor failed to work as intended and proved unreliable. The outage, which lasted more than 11 hours and affected traffic throughout the Gulf of Mexico, required controllers to manually separate ADS-B-equipped aircraft in non-radar airspace,⁹ and revealed a weakness in the ADS-B network design. At the time of the outage, ITT was operating a single network hub (called a National Operations Center) without a back-up capability.¹⁰ When the network outage occurred, surveillance data transmitted by ITT's ground system through the hub stopped reaching FAA control centers. At the same time, the SBS monitors stopped receiving ground equipment status information because this information also flows through the hub and not directly from ITT's ground system components. This outage demonstrated that unless FAA receives direct input from each of the 800 planned ITT transceivers, the Agency will not have independent assurance that the ground system is performing to FAA's specifications. According to FAA, ITT is implementing an ADS-B Outage Remediation Plan, which includes providing back-up communication between ITT and FAA locations from a second network hub. The majority of the remediation work was completed during the second quarter of fiscal year 2011.

A subsequent FAA independent test report in September 2010¹¹ further underscored the need for an effective SBS monitor that alerts FAA to performance problems in the ITT ground system and highlighted the need to expedite this effort. The report stated that the ADS-B system remains vulnerable to an outage and noted significant gaps in reporting procedures and communication between facilities that manage air traffic, Agency operational control centers, and scheduled and unscheduled ADS-B maintenance activities. Additionally, the report stated that training for more than 100 FAA staff on diagnosing problems with ADS-B was either inadequate or not provided in a timely manner. FAA has begun addressing the report's recommendations, which included that the ADS-B program office assess gaps in communication and procedures for ADS-B outages,

⁹ Much of the air traffic in the Gulf of Mexico consists of low-flying helicopters servicing hundreds of off-shore oil platforms.

¹⁰ The NOC is the hub into which all ADS-B surveillance data flows before being transmitted to controllers' displays.

¹¹ Office of Independent Safety Assessment, Automatic Dependent Surveillance-Broadcast (ADS-B) Critical Services Independent Operational Test and Evaluation (IOT&E) Report, September 10, 2010.

implement solutions to those gaps, improve notification procedures to ensure real-time reporting of service status to FAA facilities, and develop comprehensive training on ADS-B and the SBS monitor.

Another event that demonstrated the need for an independent and reliable FAA monitoring capability occurred in November 2009, when the contractor-owned and operated FAA Telecommunications Infrastructure (FTI) experienced an outage that delayed more than 800 flights nationwide. As we reported in June 2010,¹² the FTI outage exposed key limitations on FAA's and the prime contractor's abilities to oversee FTI, as neither could readily identify the specific components that failed or their location in the NAS. During our review of the FTI outage, the Air Traffic Organization's Chief Operating Officer told us that a "paradigm shift" in how FAA oversees contractor-owned systems is needed. This is particularly important given that FAA plans to rely on a contractor to develop and implement Data Communications—a NextGen transformational program that will require a multibillion-dollar investment.

FAA FACES POTENTIAL LONG-TERM VULNERABILITIES IN EFFECTIVELY OVERSEEING CONTRACTOR-OWNED SYSTEMS

FAA's shift from operating its own systems to overseeing contractor-owned and -managed systems exposes the Agency to several long-term vulnerabilities that may limit its visibility into NAS system performance. First, contractor-owned systems are expected to be fully integrated into the NAS, but it is not clear whether FAA is fully committed to applying FAA safety and quality control standards equally to all systems regardless of ownership. In addition, oversight of the early ADS-B deployment is resource-intensive and, in particular, requires logistics expertise to oversee the contractor's infrastructure. However, FAA has a personnel shortfall for these essential services Agency-wide. Having the right logistics expertise takes on greater importance in cases where contractor logistics support plans for contractor-owned systems have proven inadequate and FAA has had to assume control of contractor logistics and maintenance, which the Agency did in 2010 for the Standard Terminal Automation Replacement System (STARS).

FAA Standards, Such as Remote Monitoring, Are Not Consistently Applied to Contractor-Owned Systems

As the number of privately owned systems that are expected to be fully integrated into the NAS expands, FAA is at increased risk of inadequate contractor performance by not applying the same standards to contractor-owned systems that it requires for its own systems. This is particularly a risk given that FAA's

¹² OIG Correspondence CC-2010-012, "Letter to Chairmen Oberstar and Costello Regarding the 2009 FAA Telecommunications Infrastructure Outage," June 17, 2010.

commitment to equally applying these standards has not always been demonstrated. Most notably, the SBS monitor is unique to ADS-B and an alternative to certification; FAA has yet to require a similar type of monitoring capability for all NAS systems regardless of ownership. In the past, FAA required that new NAS systems had to be remotely monitored—a requirement that enables continuous independent oversight regardless of how far a remote system may be located from an observer who can determine whether that system is performing in accordance with FAA specifications. However, FAA recently approved a revised order on remote monitoring of NAS systems that allows the decision of whether remote monitoring will be required for contractor-owned systems to be made on a case-by-case basis. FAA's dependency on the SBS monitor demonstrates the critical need for this type of capability to oversee the ADS-B ground infrastructure. Without a similar type of capability for other contractor-owned systems, FAA could jeopardize the Agency's visibility into system performance, and of greater importance, the safety and reliability of the NAS.

Drawing distinctions between FAA-owned and contractor-owned systems in terms of requiring a monitoring capability sets a precedent that exposes FAA to potential vulnerability should FAA also decide to not hold contractors to other quality and performance standards. To provide assurance that contractor-owned systems will meet FAA's needs before putting them into operation, FAA has a series of established operating orders. For example, all FAA-owned systems are required to pass the following:

- Factory, service, and site acceptance tests to ensure that systems meet FAA standards and that FAA has a presence throughout the development and implementation cycle.
- Functional and physical configuration audits to ensure that components are manufactured and installed to specifications and standards.
- Independent operational tests and evaluations to ensure that FAA independently verifies that systems meet Agency requirements after implementation.

ADS-B implementation in Florida demonstrated the importance of taking steps to ensure that contractor-owned systems meet the same standards as those for FAA-owned systems. During a product configuration audit, which FAA requires for all newly deployed systems, regardless of ownership, FAA field personnel correctly identified that an ADS-B transceiver was installed with no back-up transmitter system, although the blueprints for the site called for a back-up. Had FAA's requirements to conduct a configuration audit not been applicable to contractor-

owned systems, this critical issue may not have been identified until the transceiver failed and the absence of a back-up capability had been revealed.

FAA's Logistics Support Needed for Effective Contractor Oversight Is Inadequate

Contractor oversight is resource intensive and requires the right expertise in a number of essential areas, one of which is logistics support. However, FAA has serious shortages in the logistics personnel needed to oversee these essential services Agency-wide. We cautioned in an October 2007 hearing before the House Aviation Subcommittee that FAA's approach for implementing ADS-B would require an extraordinary level of oversight.¹³ Currently, the ADS-B program office is using both contractor and in-house staff to oversee ITT's ADS-B implementation. More specifically, as we observed with ADS-B, staff at FAA's Logistics Center in Oklahoma City, OK, are heavily involved in providing technical expertise and oversight of the contractor-owned equipment and networks. However, once the ADS-B infrastructure is fully deployed, FAA will require a different skill mix; specifically, more internal expertise in contracting, logistics, and program management and less expertise in research and acquisition. FAA's 2010 fiscal year budget submission indicated that it identified a "serious shortage of government personnel" to oversee logistics services Agency-wide. As an important step to address this shortage, FAA requested a funding increase from its 2009 budget and included increased numbers of logistics personnel as an item in its initial acquisition workforce plan. We have work underway to examine FAA's progress in addressing these issues.¹⁴

Securing the necessary logistics expertise takes on greater urgency in cases where FAA's logistics support plans for contractor-owned systems may not be adequate. FAA requires contractors to prepare a logistics support plan to ensure that they will provide satisfactory system support and maintenance throughout the life of the contract, but this method has proven limitations. For example, in 2010, FAA assumed control of the maintenance and logistics for STARS (Standard Terminal Automation System) after the Agency determined it was financially advantageous to perform these functions in-house. However, according to the FAA logistics center, the turnover was complicated because the contractor did not maintain adequate logistics information about the STARS system. While contractors are required to prepare logistics support plans for FAA approval, FAA can find itself vulnerable should these support plans not include sufficient documentation, such as parts numbers and supplier information. FAA's experience with STARS demonstrated how this vulnerability can manifest itself.

¹³ OIG Testimony Number CC-2007-100, "Challenges Facing the Implementation of FAA's Automatic Dependent Surveillance - Broadcast Program," October 17, 2007.

¹⁴ OIG Audit Announcement, "FAA's Acquisition Workforce," issued November 23, 2009.

CONCLUSION

FAA is embarking on an urgently needed transformation of the Nation's air traffic system, and certification of NAS systems is important to ensure that new systems perform as intended and do not negatively impact safety. Regardless of ownership and whether systems are certified, FAA cannot afford to lose visibility into system performance. While we focused on FAA's efforts to monitor the performance of the uncertified ADS-B ground infrastructure in our audit, our results indicate that similar levels of contract oversight will be essential for all future NextGen-critical technologies that are contractor-owned but not certified. Our work also highlights a number of vulnerabilities that FAA faces and must mitigate in carrying out this oversight. Otherwise, the full impact of FAA's transition of systems and services to the private sector and the revised certification procedures will remain uncertain as will the Agency's ability to safely integrate contractor-owned systems into the NAS.

RECOMMENDATIONS

We recently made a number of recommendations to FAA to reduce risk and enhance contract oversight of ADS-B, which FAA has concurred with and begun to address.¹⁵ In addition, FAA is responding to recommendations from an independent safety report that addressed improving training on ADS-B and the SBS monitor for technicians and supervisors, including how to diagnose system problems.

As a result of this audit and to further reduce risk with the SBS monitor, we recommend that the SBS program office:

1. Complete the development of automated capabilities and procedures for analyzing the contractor performance data being collected from the SBS monitoring system.
2. Evaluate the number of FAA staff currently assigned to analyze the extensive volume of data the SBS monitoring system generates and require additional resources be allocated as appropriate.
3. Document and apply the lessons learned from the August 6, 2010, ADS-B outage to improve the SBS monitor's functionality and performance. Specifically, as part of the remediation plan, take steps to ensure real-time reporting of ITT transceiver service status directly to the SBS monitoring system from each ADS-B ground system transceiver site.

¹⁵ OIG Report Number AV-2011-002, "FAA Faces Significant Risks in Implementing the Automatic Dependent Surveillance–Broadcast Program and Realizing Benefits," October 12, 2010.

To address potential vulnerabilities as FAA becomes more reliant on contractor-owned systems in the NAS, we recommend that FAA:

4. Apply FAA standards and quality assurance practices to all NAS systems regardless of ownership.
5. Assess the costs and benefits of requiring a monitoring capability, similar to the SBS monitor for ADS-B, in lieu of certification for all contractor-owned systems in the NAS and require that capability to be developed as appropriate.
6. Acquire the logistics expertise needed to oversee all contractor-owned systems in the NAS to include requiring that contractor logistics support plans contain sufficient documentation regarding system maintenance.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided FAA with our draft report on June 21, 2011, and received its response on July 20, 2011. FAA's response is included in its entirety as an appendix to this report. FAA concurred with all of our recommendations, and the planned actions and milestones meet the intent for most of them. However, we are requesting that FAA clarify its actions regarding recommendations 5 and 6.

For recommendation 5, FAA identified several systems, in addition to ADS-B, for which the Agency relies on a monitoring capability. For future systems, FAA states that each program will separately assess the costs and benefits of having a monitoring capability in accordance with the Agency's Acquisition Management System policy. While we acknowledge the importance of adhering to existing policies in making these decisions, it is unclear from FAA's response whether its decisions to require monitoring capabilities will be based on the cost and benefit analyses or the priority the Agency will give monitoring capabilities in light of other investment decisions. FAA's dependency on the SBS monitor demonstrates the critical role of this type of capability in overseeing contractor-owned systems. FAA's response does not specifically recognize the critical importance of contractor monitoring for future programs, which is the intent of our recommendation. Accordingly, we are requesting that FAA clarify its response.

For recommendation 6, FAA states that it will provide training to certify 25 contractor logistics specialists, which we agree is an important step forward. However, it is unclear how FAA has determined that 25 is the appropriate number of logistics specialists needed to oversee current and future contractor-owned systems, as well as review contractor logistics support plans for sufficiency and adequacy. Therefore, we are requesting that FAA provide additional details for

determining how many logistics specialists will be needed to oversee these essential services Agency-wide, and describe its plan for achieving that goal.

ACTIONS REQUIRED

FAA's planned actions and target dates for recommendations 1, 2, 3, and 4 are responsive, and we consider these recommendations resolved but open pending completion of planned actions. However, we request that FAA clarify, within 30 days of this report, its responses to recommendations 5 and 6. Specifically, for recommendation 5, we request that FAA clarify whether the Agency will formally require a monitoring capability for future contractor-owned systems based on cost and benefit analyses. For recommendation 6, we request additional details regarding its plan to acquire the logistics support specialists that are needed to oversee current and future services Agency-wide.

We appreciate the courtesies and cooperation of FAA and industry representatives during this audit. If you have any questions concerning this report, please contact me at (202) 366-0500 or Barry DeWeese, Program Director, at (415) 744-0420.

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cc: FAA Deputy Administrator

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EXHIBIT A. SCOPE AND METHODOLOGY

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions. We conducted the audit between October 2009 and June 2011 and included such tests of procedures and records as we considered necessary, including those providing reasonable assurance of detecting abuse and illegal acts.

To conduct our work, we examined documentation provided by the program office related to the Air Traffic Certification Process and the ADS-B program. Specifically, we reviewed ADS-B implementation plans, test results, and contract documentation related to scope of work and technical performance requirements. We analyzed sections of FAA's acquisition management system and orders related to certification, logistics, maintenance, and operations. We also interviewed FAA administration personnel, program office officials, industry, and union representatives to discuss the rationale for, and impact of, the 2007 change in certification requirements. Additionally, we reviewed FAA presentations for ADS-B made to stakeholders, Performance Control Board presentations; and other documentation that were provided by FAA to industry, government and Congress. During the audit, we contacted or visited FAA Headquarters, ADS-B Program Office, the FAA Technical Center and Logistics Center, Air Carriers, ITT offices, and various Key ADS-B field sites. At those locations, we discussed a range of topics to include role in the certification process for FAA-owned facilities and potential vulnerabilities of private sector ownership of NAS systems.

EXHIBIT B. FACILITIES VISITED OR CONTACTED

Industry Contacts

- Boeing Traffic Management
- ITT Corporation
- Alaska Air Carriers Association

FAA Headquarters, Washington, DC

- Surveillance Broadcast System Program Office, Washington, D.C.

FAA Field Locations

- FAA Logistics Center and Aviation System Services at Oklahoma City, OK
- FAA Technical Center, Atlantic City, NJ
- Alaska Regional Office, Air Route Traffic Control Center, and Aircraft Certification Office in Anchorage, AK (Juneau Key Site)
- Southwest Regional Office, Houston, TX (Gulf of Mexico Key Site)
- Southern Region, College Park, GA (Louisville, KY Key Site)

EXHIBIT C. MAJOR CONTRIBUTORS TO THIS REPORT

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APPENDIX. AGENCY COMMENTS



Federal Aviation Administration

Memorandum

Date: JUL 20 2011

To: Jeffery B. Guzzetti, Assistant Inspector General for Aviation and Special Program Audits

From: Clay Foushee, Director, Office of Audit and Evaluation, AAE-1

Subject: OIG Draft Report: FAA Oversight Is Key for Contractor-Owned Air Traffic Control Systems That Are Not Certified

The Federal Aviation Administration's (FAA) NextGen implementation will be comprised of both FAA owned and operated systems as well as provisioned services provided by private corporations. Regardless of how a given capability is established within the National Airspace System (NAS), the FAA recognizes that through a combination of its Safety Management System policy, its AMS policy and its life cycle maintenance policy that fielded systems/services must be certified in order to maintain the target level of safety for the respective NAS capability.

Achieving NextGen benefits requires that the agency integrate new technologies and evolve both its oversight and business process roles. In the latter, the coordination of the respective policies identified above and their implementation is expected to provide this oversight and ensure compliance of all systems/services proposed for NAS integration. There is some work still to be done in this regard and our responses below indicate both progress for the specific Surveillance Broadcast System (SBS) program as well as plans for policy and practice implementation for other similar proposed systems and services in the future.

OIG Recommendation 1: Complete the development of automated capabilities and procedures for analyzing the contractor performance data being collected from the SBS monitoring system.

FAA Response: Concur. The SBS Program Office will complete the development of automated capabilities and procedures for analyzing the contractor performance data

being collected from the SBS monitoring system by June 2012 with an interim software build for the SBS monitor in December 2011.

OIG Recommendation 2: Evaluate the number of FAA staff currently assigned to analyze the extensive volume of data the SBS monitoring system generates and require additional resources be allocated as appropriate.

FAA Response: Concur. The SBS Program office recently approved, and is funding, an additional 6 FTEs for SBS Monitor data analysis. Additional resources from other FAA organizations will also be engaging in SBS Monitor data analysis, including Second Level Support, the Operational Support Facilities, and the Program Operations Field Managers. By December 2011, a draft In Service Management Plan will be developed which will contain details on how the FAA will manage and monitor the operations of the SBS service, including resource requirements.

OIG Recommendation 3: Document and apply the lessons learned from the August 6, 2010, Automated Data Surveillance–Broadcast (ADS-B) outage to improve the SBS monitor's functionality and performance. Specifically, as part of the remediation plan, take steps to ensure real-time reporting of ITT transceiver service status directly to the SBS monitoring system from each ADS-B ground system transceiver site.

FAA Response: Concur. The FAA has documented a step-by-step outage remediation plan which is being updated monthly and reported to the COO. To prevent further SBS Network Outages as well as address the General Accountability Office's recommendations to account for human factors in NextGen implementation, SBS is executing a 4-pronged approach to strengthen the reliability and resilience of the ITT network: 1) ITT Human Process Intervention; 2) ITT Improvement in preventing outages; 3) ITT Improvement in restorative services; and 4) FAA- ITT joint preventative measures. The majority of planned steps have been completed. The details of this remediation plan are reported in Attachment 1.

The remaining two steps are: A) Investigate improvements and implement corrective actions in the communications between ITT and FAA Operational Control Centers and Service Delivery Points, planned completion is November 30, 2011; and B) Closely monitor service and radio reliability and take corrective actions as needed. On-going analyses have been established through the use of an FAA Monitor that provides detailed monthly reports. The planned completion date of the final step and the overall remediation plan is December 30, 2011.

OIG Recommendation 4: Apply FAA standards and quality assurance practices to all NAS systems regardless of ownership.

FAA Response: Concur. The Safety Division of the Air Traffic Organization will work with Technical Operations and the program offices to develop methods and standards specifically designed to provide quality assurance practices toward all NAS systems regardless of ownership. As an example, we are presently updating our NAS

Appendix. Agency Comments

Maintenance Policy to distinguish our provisioning services with systems such as ADS-B. We will complete a draft strategy by October 31, 2011.

OIG Recommendation 5: Assess the costs and benefits of requiring a monitoring capability, similar to the SBS monitor for ADS-B, in lieu of certification for all contractor-owned systems in the NAS and require that capability to be developed as appropriate.

FAA Response: Concur. Currently, the agency accomplishes very similar monitoring, oversight & performance assurance for other FAA owned & leased systems utilizing Remote Maintenance Monitoring (RMM), Remote Maintenance Logging System (RMLS), National Airspace System Performance Analysis System (NASPAS), Operation Control Centers (OCC), and the National OCC (NOCC). The ADS-B monitoring will be accomplished in accordance with the “Technical Operations Services Maintenance Concept of Operations for 2014 and Beyond,” dated May 27, 2011. Additionally, the management of provisioned services is delineated in the draft “Order 6000.30E, National Airspace System Maintenance Policy”, which is currently under review.

For any future systems, as the monitoring for each service provision is unique to that acquisition, the Air Traffic Organization (ATO) standardizes the need for certification through the tech ops maintenance policy, but manages the specific response and its cost/benefit analyses through Acquisition Management System (AMS) policy. AMS policy applies to all acquisitions regardless of whether they are FAA owned systems or private service provisions. Recent changes to AMS policy require that the Vice President (VP) for Technical Operations be a signatory for the Implementation Strategy and Planning Document (ISPD), which identifies how a given system intends to implement a capability, integrates into the NAS and is supported for its life cycle. It is expected that this document, along with the functional requirements document, will form the basis for subsequent cost/benefit analyses and the acquisition baseline formulation for the program. These documents are all presented to the Joint Resources Council (JRC) as the basis for any final investment decision. This process ensures that new services have feasible and service certification provisions with costs fully understood as part of their proposed baseline.

The acquisition executive board (AEB) is currently reviewing this process to ensure that all proposed programs are following this process and that ATO Finance includes these requirements in their cost validation and cost/benefit analyses. Review and approval of practices to ensure this process is part of investment analysis process is part of an ongoing the Verification and Validation (V&V) subgroup activity of the AEB. The AEB is expected to receive recommended changes to current AMS practices from the V&V subgroup in the first quarter of fiscal year 2012.

OIG Recommendation 6: Acquire the logistics expertise needed to oversee all contractor-owned systems in the NAS to include requiring that contractor logistics support plans contain sufficient documentation regarding system maintenance.

FAA Response: Concur. The FAA Acquisition Workforce Council (AWC) has identified integrated logistics support professionals as a critical need in its workforce plan. To date, the AWC has identified core competencies, training requirements, and the certification path for this profession. Additionally, the FAA has identified 25 Integrated Logistics Support specialists in its acquisition workforce. The latest version of this plan, to be published in September 2011, will identify certification targets for this population in FY 2012. To address the specific needs of contractor-owned systems, by November 30, 2011 the FAA will conduct a review of its current contractor service provisions to establish sufficiency of its logistics support plans and documentation. The output of this review will be briefed to the Acquisition Workforce Council at its December 2011 meeting and will identify skill needs/gaps for contractor service provisions, update certification targets for the integrated logistics support population as appropriate, and identify additional workforce strategies for meeting such targets.