FAA's Progress and Challenges in Integrating Unmanned Aircraft Systems into the National Airspace System

Statement of
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Mr. Chairman and Members of the Subcommittee:

Thank you for inviting me here today to testify on the Federal Aviation Administration's (FAA) efforts to integrate Unmanned Aircraft Systems (UAS)[1] into the National Airspace System (NAS). As you know, demand for UAS technology is growing, and many public- and private-sector entities have identified a number of diverse uses for unmanned aircraft, including enhancing border security, surveying agricultural crops, conducting scientific research, and aiding law enforcement. FAA predicts there will be roughly 7,500 active UAS in the United States in 5 years, with over $89 billion invested worldwide in the emerging technology over the next 10 years.

Given the industry's anticipated rapid expansion, the FAA Modernization and Reform Act of 2012 directed FAA to take multiple steps to advance UAS integration, with the goal of safely integrating UAS into the NAS by 2015. As FAA works to meet this goal, the Agency faces unique challenges while ensuring that safety remains the top priority as new and complex technologies are introduced into the NAS.

My testimony today will focus on FAA's efforts to address these challenges. Specifically, I will discuss (1) FAA's progress in implementing the UAS requirements cited in the act; (2) the technological, regulatory, and management challenges to UAS integration; and (3) key actions needed to advance UAS integration. My testimony is based on our June report[2] and ongoing work. This work did not examine privacy issues related to the use of UAS.

IN SUMMARY

FAA has completed more than half of the UAS milestones in the act, such as publishing a UAS Roadmap outlining the Agency's UAS plans, and selecting six test sites. However, FAA is behind on the act's remaining requirements and will not meet the act's goal of achieving safe UAS integration by September 2015. Although FAA has authorized limited UAS operations on a case-by-case basis, considerable challenges remain to expand UAS operations. These include developing technology to prevent loss of connectivity with aircraft and reaching consensus on critical UAS regulatory standards. To advance UAS integration, we recommended that FAA gather and analyze critical operational safety data; determine the research needed from test sites; and establish timelines and requirements for developing standardized training, automated tools, and procedures for air traffic controllers. Another key action for the Agency is accelerating the development of UAS regulations, particularly for small UAS operations.

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[1] UAS are systems of aircraft and ground control stations where operators control the movements of aircraft remotely. Unmanned aircraft range in size from those smaller than a radio-controlled model airplane to those with a wingspan as large as a Boeing 737.

[2] *FAA Faces Significant Barriers to Safely Integrate Unmanned Aircraft Systems into the National Airspace System* (OIG Report No. AV-2014-061), June 26, 2014. OIG reports are available on our Web site at http://www.oig.dot.gov/.

BACKGROUND

On a case-by-case basis, FAA issues Certificates of Waiver or Authorization (COA) for public UAS use[3] and Special Airworthiness Certificates in the experimental and restricted categories for civil (private sector) UAS use. There are currently about 300 active public-use authorizations, 18 experimental special airworthiness certificates, and 2 restricted category airworthiness certificates for over 100 aircraft types. FAA recently broadened commercial UAS use by approving regulatory exemptions for seven film industry companies to operate UAS on a limited basis.

Unlike manned aircraft, UAS pilots operate unmanned aircraft from the ground either through a remote control device or a ground control station via a radio or satellite-based data link (see figure). While the capabilities of unmanned aircraft have significantly improved, they have a limited ability to detect and avoid other air traffic.
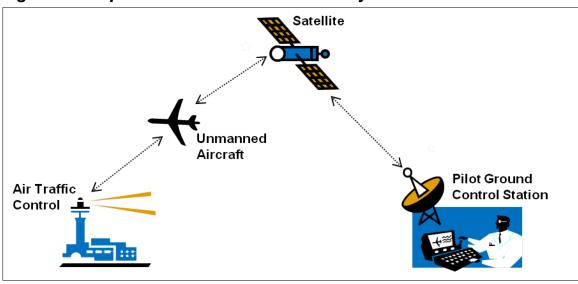
Figure. Example of an Unmanned Aircraft System

Source: OIG

FAA HAS IMPLEMENTED MORE THAN HALF OF THE REQUIRED UAS PROVISIONS, BUT IS BEHIND ON THE REMAINING ACTIONS

FAA has completed 9 of the act's 17 UAS provisions, such as publishing its 5-year UAS Roadmap,[4] establishing a comprehensive plan to safely accelerate UAS integration, and streamlining its COA processes (see table 1). However, the Agency missed statutory milestones for most of these provisions. For example, FAA announced its selection of six UAS test ranges over a year after the statutory milestone.

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[3] Public use UAS are flown by Federal, state, or local governmental agencies.
[4] The Roadmap is a guide outlining FAA's plans for integrating UAS into the NAS over a 5-year period.

Table 1. Completed UAS Initiatives as of December 2014

Initiative	Date Due	Date Completed
Establish agreements to streamline the COA process	5/14/2012	3/4/2013
Establish a program for integrating UAS into the NAS at six test ranges	8/12/2012	12/30/2013
Develop a plan for small UAS to operate in the Arctic for research and commercial purposes	8/12/2012	11/1/2012
Determine if certain UAS may operate safely in the NAS before completion of the comprehensive plan and rulemaking	8/12/2012	7/19/2013
Issue guidance regarding the operation of public-use UAS, including expediting the UAS approval process	11/10/2012	1/22/2013
Develop a comprehensive plan to safely accelerate the integration of UAS into the NAS	11/10/2012	Sept. 2013
Submit a copy of the comprehensive plan to Congress	2/14/2013	11/6/2013
Make operational at least one project at a test range	2/14/2013	April 2014
Develop and make publically available a 5-year roadmap for the introduction of UAS into the NAS	2/14/2013	11/7/2013

Note: For full status information on these and other initiatives, see attachment 1.
Source: OIG

FAA is also behind schedule in implementing the remaining eight UAS provisions. For example, FAA did not meet the act's August 2014 milestone for issuing a final rule on small UAS operations.[5] Moreover, FAA has yet to issue a Notice of Proposed Rulemaking (NPRM), which it had planned to do in June 2011—over 3 years prior to the August 2014 mandate. FAA expects to issue the NPRM for comment this month. While FAA has stated the standard for issuing a final rule is 16 months, it could take longer as the Agency expects to receive a large number of comments—all of which would have to be considered before the rule can be finalized.

FAA will also not meet Congress' September 2015 milestone for safely integrating UAS into the NAS, but Agency officials told us they will complete some steps towards integration, such as issuing a proposed rule for small UAS operations and establishing operational test ranges. FAA's 5-year UAS Roadmap contains target dates for the Agency's future integration efforts, but FAA officials stated that the target dates do not represent "commitments." As a result, while it is certain that FAA will accommodate UAS at limited locations, it remains unclear when and if full integration of UAS into the NAS will occur.

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[5] The rule is intended to establish operating and performance criteria for small UAS (under 55 pounds) in the NAS that are operated within line-of-sight of a pilot or ground observer below 400 feet.

FAA FACES TECHNOLOGICAL, REGULATORY, AND MANAGEMENT CHALLENGES TO UAS INTEGRATION

FAA is working with other Federal agencies to identify ways to resolve barriers to UAS integration; however, FAA will need to resolve technological issues to mitigate safety risks, reach consensus on critical UAS regulatory standards, and address management challenges that limit UAS operations.

First, successfully mitigating UAS safety risks depends on FAA's ability to overcome two significant technological barriers:

- **Lack of mature detect-and-avoid technology to avoid collisions.** With no pilots on board, UAS cannot comply with FAA requirements for aircraft to be able to "see and avoid" other aircraft.[6] Therefore, the safe operation of UAS relies on effective, robust technology to automatically detect other aircraft operating in nearby airspace and successfully maneuver to avoid them. Experts we interviewed said detect and avoid is the most pressing technical challenge to integration yet to be mitigated.

- **Lack of adequate control and communications technology.** The integrity, stability, and security of the link between the ground control station and unmanned aircraft are vital to safe UAS operation. However, technology has not been developed to reduce the potential for "lost link" scenarios—that is, interruptions or complete loss of connectivity. Secure and adequate radio frequencies for communication will also be necessary to ensure sufficient links. While the International Telecommunication Union[7] granted some UAS-specific radio frequency in 2012, many unknowns remain—particularly regarding the amount of frequency spectrum needed, licensing issues, control and communications standards, and security vulnerabilities.

To address these technological barriers, several research projects are under way at FAA and other agencies, such as the Department of Defense (DoD) and the National Aeronautics and Space Administration (NASA). For example, FAA is testing communications between ground operators and unmanned aircraft, and DoD is testing a ground-based detect-and-avoid system. However, it remains uncertain when these efforts will provide UAS technology to fully support safe UAS integration.

Second, FAA has yet to establish minimum regulatory standards for UAS. Specifically, the Agency still lacks:

- **Minimum performance standards for civil UAS.**[8] Despite working with a special RTCA advisory committee[9] for more than 9 years, FAA has not reached consensus

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[6] While FAA 14 CFR 91.113 speaks of a pilot's ability to "see and avoid" other aircraft, the UAS community, spearheaded by RTCA SC-228, is using the term "detect and avoid" to describe the desired capability of UAS.

[7] The International Telecommunication Union is the United Nations' specialized agency for information and communication technologies. It allocates global radio spectrum.

[8] Private or commercial use.

among Government and industry stakeholders on minimum performance standards. For example, FAA needs to develop standards for operators regarding UAS control and communication links. In March 2013, FAA tasked RTCA to form a new committee with a more narrow focus to help accelerate this effort.[10]

- **Regulatory requirements or standards for UAS design certification, pilot and crew qualifications,[11] ground control stations, and command and control reliability.** FAA has not established design standards needed to certify new civil UAS. According to FAA officials, the Agency's civil UAS projects have resulted in certification of two aircraft. However, the projects rely on a military certification rule that does not apply to new types of UAS, and the two aircraft are restricted to operations in the Arctic area. FAA officials told us that this would be a first step to developing standards for widespread use.

Table 2 lists other UAS areas that lack safety regulations, standards, and guidance, further limiting UAS operations in the NAS.

Table 2. Sample of UAS Operations Areas Needing Aviation Safety Regulations, Standards, and Guidance

Unmanned Aircraft	Pilot and Crew	Control Station	Data Link
• Policy	• Policy	• Policy	• Policy
• Certification Requirements	• Certification Requirements	• Certification Requirements	• Certification Requirements
• Technical Standards	• Operational Standards	• Technical Standards	• Technical Standards
• Performance Standards	• Procedures	• Airworthiness Standards	• Airworthiness Standards
• Airworthiness Standards	• Regulations	• Interoperability Requirements	• Interoperability Requirements
• Procedures	• Guidance Material	• Guidance Material	• Dedicated Aviation Radio Frequency Spectrum
• Regulations/ Guidance	• Training Requirements	• Maintenance Requirements	• Standardized Control Architectures
• Measures of Performance	• Medical Standards	• Means of Compliance	• Link Security Requirements
• Maintenance Requirements			

Source: OIG analysis of FAA data

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[9] Organized in 1935 as the Radio Technical Commission for Aeronautics, RTCA, Inc. is a private, not-for-profit corporation that develops consensus-based recommendations regarding communications, navigation, surveillance, and air traffic management system issues. It functions as a Federal Advisory Committee.

[10] RTCA established Special Committee 228, which is focused on more detailed standards regarding detect-and-avoid capabilities and command and control links.

[11] Crew, in addition to the pilot, can include ground-based crew, who must assist the pilot with determining UAS proximity to other aviation activities and help the pilot avoid operating beyond the visual line-of-sight limit.

While FAA continues to develop a regulatory framework for UAS, it is also working to leverage the authority Congress provided to allow some exemptions to certification requirements. Specifically, the 2012 reauthorization act allows FAA to exempt certain UAS users from the requirement to have an airworthiness certificate. This exemption is granted based on the UAS's size, weight, speed, operational capability, proximity to airports and populated areas, operation within visual line of sight, and if the UAS do not create a hazard to other airspace users. Using this authority, FAA recently broadened the commercial use of UAS. According to FAA, as of December 3, 2014, it had received 159 requests for exemptions from companies in industries such as filmmaking, pipeline inspection, aerial surveying, precision agriculture, and real estate. Thus far, FAA has approved seven of these exemption requests for companies from the film industry and is continuing its review of the remaining requests.

Third, the safe integration of authorized UAS into the NAS has been impacted by program management challenges:

- **Lack of standardized UAS-specific air traffic controller procedures and training.** Although FAA provided interim guidance on UAS-specific air traffic control, it has not established national procedures and training, which limits controllers' ability to manage air traffic that includes unmanned aircraft. Currently, air traffic controllers are forced to segregate UAS from other traffic. According to air traffic personnel, current procedures and separation standards were designed for manned aircraft and are not adequate for UAS. For example, controllers told us that the En Route Automation Modernization system, a system for processing high-altitude flight data, cannot adequately manage UAS flight plans, which contain an unusually large amount of navigational data. In addition, due to the lack of training and guidance, controllers at air traffic facilities nationwide have filed reports of problems managing UAS operations.[12] FAA established a corrective action plan in January 2013 but does not expect to resolve these issues until September 2015.

- **Organizational impediments to UAS integration and oversight.** Integrating UAS operations into the NAS presents significant organizational challenges, as it requires the collaboration of many stakeholders. In March 2012, FAA established a new UAS Integration Office, which is comprised of Aviation Safety and Air Traffic Organization (ATO) personnel and consolidates UAS expertise into a single organization. However, the office has to reach out to FAA offices beyond ATO, such as the Aircraft Certification and NextGen organizations. This is important because these offices play a large role in determining aircraft certification requirements and research and development. FAA has had difficulty working across FAA's lines of business in the past. Other organizational barriers further limit FAA's oversight of current UAS operators. For example, regional UAS safety inspectors receive work

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[12] Controllers file these reports through FAA's Air Traffic Safety Action Program, a voluntary safety reporting program that enables air traffic personnel to confidentially report air traffic safety events.

assignments from the UAS Integration Office but report to their regional managers, resulting in competing priorities for the same resources.

- **Inadequate framework for sharing and analyzing safety data.** FAA routinely collects safety data from current public-use UAS operators (mainly from DoD), as required by the COAs granted to each operator. However, the Agency does not know whether it is receiving sufficient data from COA operators, as it has no process to ensure that all incidents are reported as required. In addition, FAA has not reached agreement with DoD to obtain useful data. For example, while FAA's Office of Accident Investigation and Prevention receives annual UAS mishap data from DoD, FAA's UAS integration staff told us they do not find this information useful because it lacks detail. DoD has a wealth of other operational data, such as maintenance information, but the Agency has been unable to obtain it due to data sensitivity concerns and resource coordination. FAA and DoD formed a data sharing team to resolve these issues.

  FAA also does not have a formal system to track and classify UAS incidents currently reported outside of the COA process. FAA has stated that it receives about 25 reports per month from pilots who have seen unmanned aircraft or model aircraft operating near their aircraft. According to FAA, while many of these sightings are from general aviation or helicopter pilots, airline crews have also reported them. For example, there were three recent reports filed by air carrier pilots who said they saw unmanned aircraft while they were on final approach to John F. Kennedy International Airport. In one case, two airlines reported seeing unmanned aircraft approximately 10 miles from the runway flying at altitudes between 3,000 and 2,000 feet. According to FAA, the reports did not indicate whether any of the pilots took evasive action, and all three flights landed safely.

  According to FAA, the Agency receives these reports from multiple sources, such as air traffic control facilities and flight standard district offices. FAA officials stated that the reports range from unmanned aircraft sightings without impact to other pilots and aircraft, to pilots altering course to avoid an unmanned aircraft on a few occasions. FAA is currently working to develop a single system to record these incidents and develop a classification system to track their severity. FAA expects to complete this effort by September 30, 2015.

KEY ACTIONS NEEDED TO ADVANCE UAS INTEGRATION

Given the complexities involved, it remains unclear when and if UAS will be fully integrated into the NAS. Further, it is still not clear what "full integration" will entail. Many important questions remain unanswered, such as the timeline for developing reliable detect and avoid technology, and robust certification standards for UAS equipment and crew.

To enhance the effectiveness of the Agency's efforts to safely integrate UAS into the NAS, we made 11 recommendations to FAA in our June 2014 report, including key actions to:

- Gather and analyze critical operational safety data FAA currently receives from UAS operators and obtain the most critical safety data it needs from DoD. Because integrating UAS into the NAS is in the early stages, any and all data regarding the safety of UAS operations are paramount to understanding and mitigating hazards that may arise.

- Determine data needed from test sites to gain a greater understanding of the challenges presented by UAS in an integrated environment and how those challenges can be effectively mitigated. These data will provide critical information related to aircraft certification, air traffic control, and detect and avoid capabilities that can inform FAA's integration decisions.

- Establish timelines for developing standardized training, automated tools, and procedures for air traffic controllers, as well as reaching consensus on design and certification standards for UAS technology. Because UAS currently operate in the NAS at select locations, such as along the Nation's borders, it is critical that FAA develop the procedures, training, and tools for controllers to effectively manage UAS in the same airspace as other aircraft.
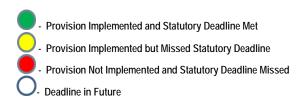
FAA has taken or planned actions that meet the intent of 10 of our recommendations. We are currently working with the Agency to fully resolve the remaining one on data sharing agreements. (See attachment 2 for the status of FAA actions for addressing our 11 recommendations.)

Other key actions for the Agency include accelerating the development of UAS regulations, particularly for small UAS operations, as well as developing an integrated budget document for UAS that clearly identifies funding needs for programs, such as pertinent air traffic control systems and operations. Furthermore, FAA will need to consider the impact of UAS integration on a wide range of Agency programs and their corresponding funding requirements. We will continue to monitor FAA's progress on these issues and work with the Agency on resolving and closing our recommendations.

This concludes my prepared statement. I will be happy to answer any questions you or the other members of the Subcommittee may have.

ATTACHMENT 1. STATUS OF FAA'S IMPLEMENTATION OF THE ACT'S UAS MILESTONES (AS OF DECEMBER 2014)

Section	Description	Deadline	Progress	Status
334c	Establish agreements to simplify process for issuing COAs for public UAS in the NAS.	5/14/2012	🟢 🟡	Met — FAA made changes to the COA process to shorten the timeframes needed for approval. Implemented Late – FAA completed a streamlined COA process via MOUs with DoD, NASA, and DOJ in March 2013.
332c(1)	Establish program for integrating UAS into the NAS at six test ranges.	8/12/2012	🟡	Implemented Late – On December 30, 2013, FAA announced the test-site applicants chosen for the six test ranges.
332d	Develop plan to designate permanent areas in the Arctic where small UAS may operate 24 hours/day for research and commercial purposes.	8/12/2012	🟡	Implemented Late – FAA's Arctic Plan was signed on November 1, 2012, and was made available to the public on FAA's Web site on December 6, 2012.
333	Determine if certain UAS may operate safely in the NAS before completion of the comprehensive plan and rulemaking.	8/12/2012	🟡	Implemented Late – FAA issued type certificates (using the 21.25 restricted category certification) to ScanEagle and Puma UAS to operate in the Arctic in July 2013, stipulating that certain UAS could operate in restricted areas of the NAS prior to the issuance of the comprehensive plan. FAA also approved seven exemptions for film industry companies.
332a(1)	Develop a comprehensive plan to safely accelerate the integration of UAS into the NAS.	11/10/2012	🟡	Implemented Late – JPDO was assigned to develop the comprehensive plan. However, the document had to undergo substantial revisions during an interagency review process.
334a	Issue guidance regarding the operation of public-use UAS including expediting the UAS approval process.	11/10/2012	🟡	Implemented Late – On January 22, 2013, the FAA issued notice N8900.207, which provides policies necessary for reviewing and evaluating the safety and interoperability of proposed UAS flight operations in the NAS, and outlines best practices and procedures that FAA has used in prior UAS approvals.
332a(4)	Submit copy of comprehensive plan to Congress.	2/14/2013	🟡	Implemented Late – After an extended executive coordination and interagency review process, FAA submitted the plan on November 6, 2013.

🟢 - Provision Implemented and Statutory Deadline Met

🟡 - Provision Implemented but Missed Statutory Deadline

🔴 - Provision Not Implemented and Statutory Deadline Missed

⚪ - Deadline in Future

Attachment 1. Status of FAA's Implementation of the Act's UAS Milestones (as of December 2014)

Section	Description	Deadline	Progress	Status
332c(4)	Make operational at least one project at a test range.	2/14/2013	🟡	Implemented Late – FAA announced the six test sites in December 2013. The first test site became operational in April 2014.
332a(5)	Develop and make publically available 5-year roadmap for the introduction of UAS into the NAS.	2/14/2013	🟡	Implemented Late – OMB required FAA to make substantial revisions to its Roadmap, and the document underwent a Legislative Referral Memorandum process. FAA published the Roadmap on November 7, 2013.
332b(3)	Issue an update to the Administration's policy statement on UAS.	8/14/2014	🔴	FAA issued an interpretive rule in June 2014 that updates the 2007 policy. However, FAA is not certain this action will meet the mandate until it receives higher level review from the Secretary.
332b(1)	Issue the Final Rule on small UAS.	8/14/2014	🔴	Missed deadline. FAA expects to issue an NPRM in December 2014, which is required in advance of the final rule.
332b(2)	Issue a NPRM to implement recommendations of the comprehensive plan.	8/14/2014	🔴	The comprehensive plan does not have specific recommendations, but does include a national objective to amend FAR Part 91.113 related to "see and avoid". This work is ongoing.
332a(3)	The safe integration of civil UAS into the NAS.	9/30/2015	⚪	Deadline in future. FAA officials stated that, by this date, they will have the test sites operational, issue the proposed rule for small UAS, and approve a ground-based detect-and-avoid system available for certain UAS.
332b(2)	Issue final rule on integration of all UAS into the NAS.	12/14/2015	⚪	Deadline in future.
334b	Develop and implement operational and certification requirements for the operation of public UAS in the NAS.	12/31/2015	⚪	Deadline in future.
332c(1)	Termination of program for integrating UAS into the NAS at six test ranges.	2/14/2017	⚪	Deadline in future.
332c(5)	Submit report of findings and conclusions concerning projects from six test ranges.	5/15/2017	⚪	Deadline in future.

🟢 - Provision Implemented and Statutory Deadline Met

🟡 - Provision Implemented but Missed Statutory Deadline

🔴 - Provision Not Implemented and Statutory Deadline Missed

⚪ - Deadline in Future

Attachment 1. Status of FAA's Implementation of the Act's UAS Milestones (as of December 2014)

ATTACHMENT 2. STATUS OF OIG RECOMMENDATIONS TO ADVANCE UAS INTEGRATION

OIG Recommendation	Status/FAA Action Taken and Planned
Publish a report annually detailing ongoing research activities and progress FAA and other entities are making to resolve technical challenges.	**Open**/FAA is developing a detailed inventory of past and ongoing research activities. We are working with FAA to obtain and review the inventory.
Establish milestones for the work needed to determine the appropriate classification system for unmanned aircraft.	**Open**/FAA has work under way to develop milestones and associated tasks with developing a UAS classification system. There are two phases with completion of Phase 1 by September 30, 2015 and Phase 2 by September 30, 2016.
Establish a timeline for developing standardized training and procedures for air traffic controllers responsible for UAS operations.	**Open**/FAA stated it would develop a timeline for providing standardized training for air traffic controllers by October 30, 2014, but the Agency has not yet done so.
Assess and determine the requirements for automated tools to assist air traffic controllers in managing UAS operations in the NAS.	**Open**/FAA expects to complete work by October 31, 2015 to determine the requirements for automated tools to assist air traffic controllers.
Create a standardized framework for data sharing and analysis between UAS operators by: (a) validating a sample of the data it currently receives from UAS operators; (b) finalizing an agreement with DoD for pertinent UAS operational data; and (c) completing development of a sharing and analysis database.	**Unresolved**/FAA has taken some actions by validating mishap data received from DoD and is working with MITRE to establish a sharing and analysis database that will be completed by September 30, 2015. However, we are working to resolve when FAA expects to finalize its work with DoD to obtain other operational data, such as airworthiness data.
Develop and implement a consistent process to review and approve COAs across FAA regions, adopt measures that increase process efficiency and oversight, and provide necessary guidance and training to inspectors.	**Open**/FAA developed training courses for FAA inspectors and established a COA Standardization Working Group to develop a consistent COA process. By September 30, 2015, the team will produce new guidance for Flight Standards and Air Traffic personnel.
Complete airspace simulation and safety studies of the impact of UAS operations on air traffic control.	**Open**/FAA has work under way and expects to have all safety risk management panels completed by October 31, 2015.
Develop a mechanism to verify that the UAS Integration Office, all FAA lines of business, and field safety inspectors are effectively coordinating.	**Open**/FAA developed a process to solicit feedback on effectiveness of coordination during executive-led UAS meetings and weekly staff meetings. By January 31, 2015, FAA expects to implement a Quality Management System process to verify that coordination is effective.

OIG Recommendation	Status/FAA Action Taken and Planned
Determine the specific types of data and information needed from each of the six planned test ranges to facilitate safe UAS integration.	**Open/**FAA has provided the test sites with a report identifying potential research areas based on the September 2012 Concept of Operations. Also, the FAA Technical Center has assigned a lead to coordinate how data is collected. This will be ongoing through December 31, 2017.
Establish a more detailed implementation plan with milestones and prioritized actions needed to in the near, mid, and long term.	**Open**/FAA worked with MITRE to develop a UAS Integration Strategy to assist with development of a UAS Program Plan. FAA expects to issue a detailed program plan by September 30, 2015.
Establish metrics to define progress in meeting implementation milestones as a basis for reporting to Congress.	**Open**/FAA has developed a UAS Roadmap that will be updated annually. The updated roadmap is under review by the Office of Management and Budget.
Complete airspace simulation and safety studies of the impact of UAS operations on air traffic control.	**Open**/FAA has work under way and expects to have all safety risk management panels completed by October 31, 2015.
Develop a mechanism to verify that the UAS Integration Office, all FAA lines of business, and field safety inspectors are effectively coordinating.	**Open**/FAA developed a process to solicit feedback on effectiveness of coordination during executive-led UAS meetings and weekly staff meetings. By January 31, 2015, FAA expects to implement a Quality Management System process to verify that coordination is effective.
Determine the specific types of data and information needed from each of the six planned test ranges to facilitate safe UAS integration.	**Open/**FAA has provided the test sites with a report identifying potential research areas based on the September 2012 Concept of Operations. Also, the FAA Technical Center has assigned a lead to coordinate how data is collected. This will be ongoing through December 31, 2017.
Establish a more detailed implementation plan with milestones and prioritized actions needed to in the near, mid, and long term.	**Open**/FAA worked with MITRE to develop a UAS Integration Strategy to assist with development of a UAS Program Plan. FAA expects to issue a detailed program plan by September 30, 2015.
Establish metrics to define progress in meeting implementation milestones as a basis for reporting to Congress.	**Open**/FAA has developed a UAS Roadmap that will be updated annually. The updated roadmap is under review by the Office of Management and Budget.

Source: OIG

Attachment 2. Status of OIG Recommendations to Advance UAS Integration