International Civil Aviation Organization

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Agenda Item 5: Provision of ATM/AIS/SAR in the Asia/Pacific Region, including associated CNS matters

INTEGRATION OF UNMANNED AIRCRAFT SYSTEMS (UAS) INTO THE UNITED STATES' NATIONAL AIRSPACE SYSTEM (NAS)

(Presented by United State of America)

SUMMARY

This paper presents an update of the FAA's work to integrate UAS into the NAS. Because they are inherently different from manned aircraft, introduction of UAS into the nation's airspace is challenging for both the FAA and aviation community. UAS must be integrated into a NAS that is evolving from ground-based navigational aids to a GPS-based system in NextGen.

This paper relates to –

Strategic Objectives:

A: ***Safety*** *– Enhance global civil aviation safety*

C: ***Environmental Protection and Sustainable Development of Air Transport*** *– Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

Global Plan Initiatives:

GPI-6 Air traffic flow management
GPI-9 Situational awareness
GPI-12 Functional integration of ground systems with airborne systems
GPI-17 Data link applications
GPI-21 Navigation systems
GPI-22 Communication infrastructure

1. INTRODUCTION

1.1 Unmanned Aircraft Systems (UAS) come in a variety of shapes and sizes and serve diverse purposes. They may have a wingspan as large as a Boeing 737 or smaller than a radio-controlled model airplane. Regardless of size, a designated pilot is always in command of a UAS.

1.2 Historically, UAS have supported military and security operations overseas, and training performed in the United States. Today, UAS are used to perform border and port surveillance by the Department of Homeland Security, to help with scientific research and environmental monitoring by NASA and NOAA, to support public safety by law enforcement agencies, to help state universities conduct research, and to support various other missions for public (government) entities.

1.3 Because they are inherently different from manned aircraft, introduction of UAS into the nation's airspace is challenging for both the FAA and aviation community. UAS must be integrated into a National Airspace System (NAS) that is evolving from ground-based navigational aids to a GPS-based system in NextGen.

2. DISCUSSION

2.1 The FAA's Role: Safety

2.1.1 Safety is the FAA's top focus for UAS operations in the NAS. It is critical that UAS are not a hazard to other aircraft and do not compromise the safety of people or property.

2.1.2 The FAA authorizes UAS to fly outside "restricted" airspace in two different ways: Special Airworthiness Certificates for civil aircraft and Certificates of Waiver or Authorization (COA) for UAS flown by public entities. Recreational users of model aircraft, usually radio-controlled, are covered by separate FAA guidance at http://www.faa.gov/documentLibrary/media/Advisory_Circular/91-57.pdf

2.2 Civil UAS

2.2.1 Obtaining an experimental airworthiness certificate for a particular UAS is currently the only way civil operators of unmanned aircraft are accessing the NAS. Experimental certificate regulations preclude carrying people or property for compensation or hire, but do allow operations for research and development, flight demonstrations and crew training. The FAA is working with civilian operators to collect technical and operational data that will help to refine the UAS airworthiness certification process. The agency is currently developing a future path for safe integration of civil UAS into the NAS as part of NextGen implementation.

2.3 Public UAS

2.3.1 COAs are available to public entities that want to fly a UAS in civil airspace, such as military, law enforcement and other governmental agencies. Applicants make their request through an online process and the FAA evaluates the proposed operation to see if it can be conducted safely. The agency issues a COA based on the following principles:

- The COA allows an operator to use a defined block of airspace and includes special provisions unique to the proposed operation. For instance, a COA may require flying only under Visual Flight Rules (VFR) and/or only during daylight hours. COAs usually are issued for a specific period -- up to two years in many cases.

- Most COAs require coordination with an appropriate air traffic control facility and may require a transponder on the UAS to operate in certain types of airspace.
- Because UAS technology is not currently able to comply with "see and avoid" rules that apply to all aircraft, a visual observer or an accompanying "chase plane" must maintain visual contact with the UAS and serve as its "eyes" when operating outside airspace that is restricted from other users.
- COAs Issued:

2009	146
2010	298
2011	313

There were 295 COAs active as of Dec 31, 2011.

2.4 Streamlining the Process

2.4.1 The FAA has achieved the first UAS milestone in the 2012 FAA Reauthorization – streamlining the process for public agencies to fly UAS in the NAS.

2.4.2 The FAA has been working with its government partners to streamline COA procedures. In 2009, the FAA, NASA and the Departments of Defense and Homeland Security formed a UAS Executive Committee, or "ExCom" to address UAS integration issues. The ExCom established a working group that developed suggestions to expedite the COA process and increase transparency into those activities.

2.4.3 The FAA has established metrics for tracking COAs throughout the process and improving the on-time rate for granting an authorization. The agency also developed an automated, web-based process to streamline steps and ensure a COA application is complete and ready for review. The agency has expedited procedures in place to grant one-time COAs for time-sensitive emergency missions such as disaster relief and humanitarian efforts.

2.4.4 Starting on March 29, 2012 the FAA introduced another improvement by changing the length of a COA authorization from the current 12-month period to 24 months.

2.5 Model Aircraft

2.5.1 Recreational use of airspace by model aircraft is covered by FAA Advisory Circular 91-57, which generally limits operations to below 400 feet above ground level and away from airports and air traffic. In 2007, the FAA clarified that AC 91-57 only applies to modelers, and specifically excludes individuals or companies flying model aircraft for business purposes.

2.6 Operation and Certification Standards

2.6.1 The FAA is developing new policies, procedures and approval processes to address the increasing desire by civilian operators to fly UAS in the NAS. Developing and implementing these new UAS standards and guidance is a long-term effort.

- The FAA chartered a UAS Aviation Rulemaking Committee in 2011 to develop inputs and recommendations on appropriate operational procedures, regulatory standards and policies before allowing routine UAS access to the nation's airspace.
- The FAA has asked RTCA – a group that facilitates expert advice to the agency on technical issues – to work with industry to assist in the development of UAS standards. RTCA's technical group will address questions about how UAS will handle communication, command and control and how they will "sense and avoid" other aircraft.

2.6.2 The FAA continues to work closely with its international aviation counterparts to harmonize standards, policies, procedures and regulatory requirements.

2.7 UAS Test Sites

2.7.1 In the FAA 2012 reauthorization, Congress directed the FAA to establish six UAS "pilot projects," generally referred to as test sites. These sites will provide valuable data to help safely integrate UAS into the nation's airspace.

2.7.2 Some facets of test site selection and operation include:

- Safe designation of airspace for integrated manned and unmanned flight operations in the national airspace system
- Development of certification standards and air traffic requirements for unmanned flight operations
- Coordinating with and leveraging the resources of NASA and the Department of Defense
- Addressing both civil and public unmanned aircraft systems
- Ensuring that the program is coordinated with the Next Generation Air Transportation System
- Ensuring the safety of unmanned aircraft systems and related navigation procedures before they are integrated into the national airspace system

2.7.3 This summer, the agency expects to request proposals leading to the selection of the test sites and their management organizations by the end of 2012.

2.8 Small Unmanned Aircraft

2.8.1 Small unmanned aircraft (sUAS) are the type of UAS likely to grow most quickly in civil and commercial operations in the near term because of their versatility and relatively low initial cost and operating expenses. An Aviation Rulemaking Committee (ARC) examined the operational and safety issues associated with sUAS and provided recommendations on how to proceed. We expect to publish a Notice of Proposed Rulemaking later this year.

2.8.2 Small UAS also hold great promise for law enforcement use. The 2012 reauthorization bill directed the FAA to "allow a government public safety agency to operate unmanned aircraft weighing 4.4 pounds or less" under certain restrictions. The bill specified these UAS must be flown within the line of sight of the operator, less than 400 feet above the ground, during daylight conditions, inside Class G (uncontrolled) airspace and more than five miles from any airport or other location with aviation activities.

2.8.3 Prior to the congressional action, the FAA and the Department of Justice had been working to establish an agreement to simplify the COA process for law enforcement – an agreement that also meets the mandate. Initially, law enforcement organizations will receive a COA for training and performance evaluation. When the organization has shown proficiency in flying its UAS, it will receive an operational COA. The agreement also expands the allowable UAS weight up to 25 pounds.

2.9 A New Office for New Technology

2.9.1 The FAA continues to move aggressively toward the safe, timely and efficient integration of UAS into the nation's air transportation system. In March 2012, the agency created a new UAS Integration Office, headed by a single executive, which brings together specialists from the aviation safety and air traffic organizations. The office serves as the FAA's one-stop portal for all matters related to civil and public use of unmanned aircraft systems in U.S. airspace.

2.9.2 Over more than five decades, the FAA has a proven track record of introducing new technology and aircraft safely into the NAS. We are confident we will successfully meet the challenges posed by UAS technology now and in the future.

2.10 Find additional information at the following web sites:

http://www.faa.gov/about/initiatives/uas/

COA information:
http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/systemops/aaim/organizations/uas/coa/

Civil UAS certification:
http://www.faa.gov/documentLibrary/media/Order/8130.34A.pdf

3. CONCLUSION

3.1 The meeting is invited to note the information contained in this paper and discuss any relevant matters as appropriate.

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