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**ASSEMBLY — 39TH SESSION**

**TECHNICAL COMMISSION**

**Agenda Item 33: Aviation safety and air navigation monitoring and analysis**

**INTEGRATION OF UNMANNED AIRCRAFT SYSTEMS (UAS)**

(Presented by the United States)

**EXECUTIVE SUMMARY**

The number of Unmanned Aircraft Systems (UAS) operating globally is likely to bypass the number of manned aircraft operations in the near future. The safety of all aircraft, manned and unmanned, as well as the safety of people and property on the ground, depends on a holistic approach to effectively integrating UAS(s) into national airspaces. The United States is undertaking an incremental and multi-faceted approach toward UAS integration, which includes significant educational outreach activities. This paper will inform the Assembly of the Federal Aviation Administration (FAA)'s UAS outreach efforts and provide an update on regulatory framework activities.

<i>Strategic Objectives:</i>	This working paper relates to the Safety Strategic Objective.
<i>Financial implications:</i>	This paper has no significant financial implications.
<i>References:</i>	A39-WP/103-TE/28 <i>Prioritize Unmanned Aircraft Systems Integration</i> , presented by the United States

## 1. INTRODUCTION

1.1 In the United States, in addition to procedural requirements and new regulations, successful Unmanned Aircraft Systems (UAS) integration is being achieved through focused outreach efforts to assimilate this new category of operators into the established system. UAS outreach includes a series of actions and programs designed to develop in UAS operators, an aviation safety-based outlook that drives a culture of accountability, and provides them with the information needed to effectively comply with regulations and adhere to best practices.

1.2 The Federal Aviation Administration (FAA) has collaborated with the UAS industry, traditional aviation stakeholder groups, law enforcement agencies, and other partners to implement a comprehensive UAS outreach campaign that promotes education, safety considerations, and regulatory compliance. This paper outlines the major efforts thus far undertaken by the FAA, to safely integrate UAS into the United States.

## 2. DISCUSSION

2.1 In addition to considering several regulatory actions for UAS integration into the U.S. national airspace system, the FAA has launched a number of targeted educational campaigns tailored to reach the emerging new sector of UAS operators. These efforts address current legal provisions, best practices, and safety guidelines for both hobby and commercial UAS operators. To reach the widest possible audience, the FAA sends representatives to industry events and conferences, uses social media, manages a web-based application for personal electronic devices, and leverages internet platforms for sharing information and videos. Additionally, in December 2015, the FAA successfully established an online registration system for certain types of UAS. These initiatives are further explained in paragraphs 2.2 through 2.9.

### 2.2 “Know Before You Fly”

2.2.1 The FAA, in partnership with industry, developed a multimedia effort to educate users about the safe and responsible operation of UAS. This campaign educates prospective operators who want to fly for personal or business use, but lack the understanding of what regulations may prohibit the operation of UAS in specific locations or for specific purposes.

2.2.2 The “Know Before You Fly” website provides prospective users with information and guidance to fly safely and responsibly. The website includes information for recreational, commercial, and government users and features an interactive map, videos, quizzes, and downloadable materials such as a pre-flight checklist and flying safely poster.

2.2.3 This campaign receives support from industry partners who use it to help educate their customers, and who direct UAS operators to the website for information and resources. Most notably, the FAA worked in collaboration with UAS manufacturers who have voluntarily agreed to include “Know Before You Fly” materials in product packaging.

### 2.3 B4UFLY

2.3.1 The FAA is concerned about increasing reports of unsafe operations of unmanned aircraft near airports, over populations, and in close proximity to manned aircraft. In an effort to help prevent

conflicts between manned and unmanned aircraft through increased awareness, the FAA developed the B4UFLY application.

2.3.2 This is a smartphone application that is available for the iPhone and Android operating systems, and provides real-time situational awareness to UAS operators by letting them know about potential conflicts, such as nearby airports, temporary flight restrictions, or restricted airspace in their current or planned location.

2.3.3 The application helps UAS operators determine which restrictions or requirements are in effect and the interface provides an interactive map with filtering options. It has been downloaded on over 40,000 devices to date, and the FAA has received positive feedback from both UAS operators and law enforcement personnel who also need real-time information about flight restrictions and requirements pertaining to UAS.

## 2.4 **FAA Safety Team**

2.4.1 The FAA Safety Team (FAASTeam) is the FAA's flight safety educational outreach mechanism. The FAASTeam program managers, working with operations inspectors from FAA Flight Standards Service District Offices (FSDOs) around the country, and more than 4,000 volunteer representatives from outside the FAA, bring the latest safety information to the public through individual contacts, online courses, FAA Safety Briefing magazine, seminars, and webinars. In addition to providing information to the general public about UAS safety best practices, the FAASTeam has joined with the Academy of Model Aeronautics and other industry partners to promote safe and compliant operation of UAS to their members.

## 2.5 **Public Service Announcements (PSAs)**

2.5.1 The FAA has partnered with industry leaders, UAS organizations, professional sports teams, and airports to release PSAs on television, via internet videos, and other media. As an example, the FAA worked with a U.S. football team from one of the largest cities to develop a PSA that broadcasts during games to crowds of up to 75,000 people. This PSA informs the public about the prohibition of flying over sports stadiums, as well as the prohibition and dangers of interfering with emergency responders dealing with wildfires. Additionally, the FAA has developed PSAs for over 20 of the nation's airports to display on media throughout their terminals.

## 2.6 **Law Enforcement Resources**

2.6.1 The FAA recognizes that state and local Law Enforcement Agencies (LEAs) are usually in the best position to deter, detect, investigate, and pursue enforcement actions to stop unauthorized or unsafe UAS operations. There is often a connection between aviation regulations and other laws or ordinances as they relate to unsafe and unauthorized UAS operations, and that shared interests are best served through collaboration.

2.6.2 To support the partnership between the FAA and U.S. LEAs, the FAA issued the Law Enforcement Guidance for Suspected Unauthorized UAS Operations. This guidance assists LEAs in understanding the legal framework that serves as the basis for FAA legal enforcement action against UAS operators for unauthorized and/or unsafe UAS operations.

2.6.3 The FAA also developed a quick reference card as a tool to help law enforcement officers utilize the procedures presented in the full-text guidance and in other FAA materials in a real world environment. The reference card informs these officers as to what information should be gathered on-

scene, simplifies the reporting process to the FAA, answers common questions, and provides a basis from which officers can form a situational risk assessment.

## 2.7 “No Drone Zone”

2.7.1 The FAA has marketed the phrase “No Drone Zone” to simplify and streamline the communication of certain flight restrictions to potential UAS operators wishing to fly in security sensitive areas or at high capacity events. The “No Drone Zone” campaign has been used to educate the public about temporary flight restrictions during large sporting events and in disaster response areas. The campaign is also used to describe the standing flight restrictions in and around the U.S. capital region. “No Drone Zone” campaign materials are available to government officials and other partners to use to educate UAS operators about local flight restrictions. For example, the U.S. National Park Service displays them around tourist spots in Washington, DC.

## 2.8 Surveillance

2.8.1 FAA aviation safety inspectors conduct surveillance and inspection of UAS operations as they would any other aircraft with regard to safety and compliance. By providing oversight of certain UAS operations, FAA aviation safety inspectors are able to gain exposure to various types of UAS operations that are being conducted in order to determine regulatory compliance, and to make safety assessments and recommendations on-site. If found non-compliant, inspectors are able to immediately educate UAS operators and, when necessary, initiate enforcement action. As part of the enforcement process, inspectors can send an educational letter to UAS operators who may not be in compliance with the registration requirement or other regulations but pose no direct threat to the airspace system. This letter serves as another means of outreach in an effort to enable UAS operators to achieve and maintain compliance.

## 2.9 Regulatory Framework

2.9.1 In the past year, the FAA has pursued a number of regulatory actions to integrate UAS effectively.

2.9.2 In December of 2014, the FAA began issuing grants of exemption (known as Section 333 Exemptions) to allow certain UAS operators to perform safe and legal commercial operations. These authorizations are granted on a case-by-case basis and outline specific operational and performance criteria for operating UAS in the national airspace system. In advance of the final rulemaking, these exemptions provide accommodation for UAS utility and innovation while promoting safety and discouraging illegal operations.

2.9.3 In 2015, the FAA published a Notice of Proposed Rulemaking (NPRM) to allow routine use of certain small UAS (under 55 pounds, or 25 kilograms), while maintaining flexibility to accommodate future technological innovations. The NPRM outlines safety rules for small UAS conducting operations, limiting flights to daylight and visual-line-of-sight operations, and prohibiting flight directly over people not directly involved in the operation of the aircraft. The NPRM proposes height restrictions, operator certification, optional use of a visual observer, and operational limits. The final rule, which creates a new “Part 107” in Title 14 of the United States Code of Federal regulations, was published on 28 June 2016, its provisions will go into effect on 29 August 2016.

2.9.4 In December 2015, the FAA implemented a new rule for the registration and marking of certain recreational UAS. The FAA processed over 400,000 registrations in the first three months of

Registry activation. Registration is of an operator, not a vehicle; one registrant may therefore represent the ownership of more than one vehicle.

2.9.5 In March of 2016, the FAA expanded the web-based registration process to allow for the streamlined registration of commercial, government, and other non-recreational UAS. Unlike the registration requirement for recreational UAS, each individual aircraft that is used for a commercial or government operation is required to have a unique registration number.

2.9.6 In addition, the FAA established an aviation rulemaking committee in March 2016 with industry stakeholders to develop recommendations for a regulatory framework that would allow certain UAS to be operated directly over people who are not directly involved in the operation of the aircraft.

### 3. CONCLUSION

3.1 Collaboration between the United States government and industry is essential to the successful integration of UAS into the U.S. national airspace system. Such collaboration extends to the development of regulatory frameworks, guidance materials, media outreach, and educational information to the UAS user community.

3.2 The United States has found that regular solicitation of perspectives from non-traditional stakeholders is essential to the successful integration of UAS into the national airspace system. Entities such as law enforcement, major event planners, and large commercial entities that do not traditionally have a stake in aviation will have direct involvement in the integration of UAS. Therefore, the perspectives of these stakeholders will be critical in effectively integrating UAS operations in a safe and efficient manner.

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