



Committee on Transportation and Infrastructure
U.S. House of Representatives
Washington, DC 20515

Bill Shuster
Chairman

Christopher W. Vieson, Staff Director

Peter A. DeFazio
Ranking Member

Katherine W. Dedrick, Democratic Staff Director

July 6, 2018

BACKGROUND MEMO

TO: Members, Subcommittee on Aviation
FROM: Staff, Subcommittee on Aviation
RE: Roundtable Policy Discussion on “Counter UAS Issues”

PURPOSE

On Wednesday, July 11, 2018, at 10:00 a.m., in 2167 Rayburn House Office Building, Members of the Subcommittee on Aviation will participate in a roundtable discussion on issues related to the use of counter unmanned aircraft systems (c-UAS). The Subcommittee will hear from:

- Angela Stubblefield, Deputy Associate Administrator for Security and Hazardous Materials Safety, Federal Aviation Administration
- Steve Mucklow, Special Assistant to the Deputy Assistant Secretary of Defense for Homeland Defense Integration and Defense Support of Civil Authorities, Department of Defense
- David Silver, Vice President for Civil Aviation, Aerospace Industries Association
- Doug Johnson, Vice President for Technology Policy, Consumer Technology Association
- Lisa Ellman, Co-Executive Director, Commercial Drone Alliance

BACKGROUND

Unmanned Aircraft Systems

Unmanned aircraft systems (“UAS” or “drones”) have been used in the United States for nearly a century.¹ In recent years, the number of UAS has grown dramatically due to rapid advances in technology and resulting reductions in price. The FAA estimates that the number of

¹ John David Blom, *Unmanned Aerial Systems: A Historical Perspective*, Occasional Paper 37, pp 46. Combat Studies Institute Press, US Army Combined Arms Center. Available at: <http://usacac.army.mil/cac2/cgsc/carl/download/csipubs/OP37.pdf>

model “small” UAS, those weighing 55 pounds or less, may double from 1.1 million to more than 2.4 million between 2017 and 2022.² Similarly, the FAA estimates the number of commercial UAS may grow from 110,604 in 2017 to more than 700,000 by 2022.³ Interest in UAS operations continues to expand as the number of potential applications grows and technology improves. The economic potential of drones is valued in the billions of dollars across various sectors including agriculture, construction, defense, energy, entertainment, and transportation.⁴

The Federal Aviation Administration (FAA) regulates all civil aircraft, including UAS. Applicable laws include the *FAA Modernization and Reform Act of 2012* (P.L. 112-95) and the *FAA Extension, Safety, and Security Act of 2016* (P.L. 114-190). Together, these laws comprise a substantial part of statutory framework applicable to the operation of UAS. In addition, the FAA promulgated 14 C.F.R. Part 107 in 2016, which applies to the operation of small UAS. Part 107 includes a waiver process to enable more advanced UAS operations. Finally, the House-passed *FAA Reauthorization Act of 2018* (H.R. 4) includes several provisions intended to further advance the safe integration and operation of UAS.

Unlawful and Illicit UAS Operations

The growth in lawful UAS operations has been accompanied by a growth in illicit and unlawful uses of UAS. Of great concern, UAS have been sighted operating in a suspicious manner in proximity to military and other national security-related installations, raising concerns about hostile surveillance and the safety of personnel.⁵ The operators of the UAS in these cases have not necessarily been readily identifiable. These concerns are heightened by reports of foreign terrorist groups modifying commercially-available UAS and using them as weapon delivery systems.⁶

Because of these national security concerns, Congress authorized the Department of Defense (DoD) and the Department of Energy (DOE) to use c-UAS equipment to protect certain facilities and assets in the United States in the *National Defense Authorization Act for Fiscal Year 2017* (P.L. 114-328).⁷ DoD’s authority was further clarified in the *National Defense Authorization Act for Fiscal Year 2018* (P.L. 115-91). Generally speaking, c-UAS equipment can detect and interdict UAS using a variety of kinetic or non-kinetic means.

Under their respective authorities, both DoD and DOE must coordinate closely with the Department of Transportation and the FAA to ensure c-UAS equipment use does not adversely affect the safety of other aircraft (as further described below) or unduly impact lawful operations

² *FAA Aerospace Forecast 2018-2038*, page 41. Available at:

https://www.faa.gov/data_research/aviation/aerospace_forecasts/media/Unmanned_Aircraft_Systems.pdf

³ *Id.* at 43.

⁴ <http://www.goldmansachs.com/our-thinking/technology-driving-innovation/drones/>

⁵ Bart Jansen. “FAA prohibits drones flights over federal prisons, Coast Guard bases.”, *USA Today*, Jun. 26, 2018.

⁶ Thomas Gibbons Neff., “ISIS drones are attacking U.S. troops and disrupting airstrikes in Raqqa, officials say”, *Washington Post*, Jun. 14, 2017. Available at:

https://www.washingtonpost.com/news/checkpoint/wp/2017/06/14/isis-drones-are-attacking-u-s-troops-and-disrupting-airstrikes-in-raqqa-officials-say/?utm_term=.98ba2a6b6e4b

⁷ 10 U.S.C. § 130i & 50 U.S.C. § 2661.

of other aircraft, including other UAS. These interagency coordination processes also serve to ensure consistent protocols nationwide to identify and mitigate threats posed by illicit UAS operations. As mentioned previously, the DoD's authority was amended in 2017 to enable protection of additional facilities and assets.⁸

Civilian law enforcement officials have also grown increasingly concerned about illicit and unlawful uses of UAS in recent years. They have observed instances of a UAS being used to smuggle contraband, including weapons, into prisons.⁹ Criminals have also been observed using small UAS to aid drug smuggling operations across the U.S.-Mexico border.¹⁰ Unlawfully operated UAS have also crashed in crowded sports venues.¹¹ In early-2018, there was a non-fatal helicopter crash in which a UAS might have been a contributing factor.¹² There are also numerous reports of UAS sightings near airports, operations that might be in violation of FAA regulations.

In light of such unlawful or illicit UAS operations, there have been proposals and discussions to authorize the Department of Homeland Security, the Department of Justice, and other law enforcement agencies to operate c-UAS equipment. Legislation has been introduced and marked up in the Senate.

Policy Issues related to c-UAS Equipment

The use of c-UAS equipment in the National Airspace System poses unique questions and policy challenges. According to one report, there are at least 235 available c-UAS products manufactured by 155 firms in 33 countries.¹³ c-UAS products are often military hardware that are typically not designed for use in civilian environments. These systems have capabilities ranging from radio frequency (RF) detection, RF jamming, spoofing, GPS jamming, and casting nets to beaming lasers.¹⁴ The effects of c-UAS operation on manned aircraft systems, avionics, and air traffic control systems are unclear or unknown in many cases.

There are many aircraft types with different avionics and system configurations that must be considered. Air traffic control systems pose similar challenges for the safe operation of c-UAS equipment. Because of the unknowns, the FAA was compelled to respond after certain c-UAS equipment vendors apparently offered to demonstrate their technology directly to airport operators. In a letter to airport sponsors dated October 26, 2016, the FAA wrote that,

⁸ § 1692.

⁹ Tracy Samilton, "Prisons Work To Keep Out Drug-Smuggling Drones", *National Public Radio.*, Nov. 15, 2017, Available at: <https://www.npr.org/2017/11/15/564272346/prisons-work-to-keep-out-drug-smuggling-drones>

¹⁰ Gina Harkins, "Drone drug flights surge along U.S.-Mexico border as smugglers hunt for soft spots." *National Post.* Jun. 25, 2018, *National Post.* Available at: <http://nationalpost.com/news/world/secret-drone-flights-surge-along-u-s-mexico-border-as-smugglers-hunt-for-soft-spots>

¹¹ Michael Laris, "Stadium and team owners see drones as major league threat" *Chicago Tribune*, May 11, 2018,

¹² Alan Levin. "What May Be U.S.'s First Drone-Linked Aircraft Crash Is Being Investigated", *Bloomberg*, Feb. 16, 2018. Available at: <https://www.bloomberg.com/news/articles/2018-02-16/what-may-be-first-drone-linked-copter-crash-being-investigated>

¹³ Kelsey Atherton. "As Counter-UAS Gains Ground, Swarm Threat Looms," *Aviation Week & Space Technology*, Mar. 6, 2018-Apr. 8, 2018. Pp. 36-37

¹⁴ Arthur Michael Holland. "Counter-Drone Systems", Feb. 2018. Available at: <http://dronecenter.bard.edu/files/2018/02/CSD-Counter-Drone-Systems-Report.pdf>.

“[u]nauthorized UAS detection and counter measure deployments can create a host of problems, such as electromagnetic and RF interference affecting safety of flight and air traffic management issues.”¹⁵ The FAA further advised in the letter that such unauthorized activities might violate airport grant assurances with which airport sponsors must comply.

These types of highly technical issues are the subject of ongoing FAA, DoD, and DOE interagency efforts to deploy counter-UAS equipment in a safe manner. These efforts assume even greater importance as other government agencies seek authority to operate c-UAS equipment. Each day, thousands of commercial, private, and government flights operate in the National Airspace System (NAS) at various altitudes. While the DoD and DOE seek to deploy c-UAS equipment to protect a set of facilities and assets, the extension of similar authorities to other federal agencies could magnify any potential risks to the NAS.

Another policy issue is the effect of c-UAS equipment on lawfully operated UAS. The NAS is a federally-regulated public domain. There are concerns that law-abiding operators of UAS could be unintentionally and adversely affected by the use of c-UAS equipment, which could cause economic and other harms. Finally, the use of certain c-UAS equipment within the United States implicates certain criminal provisions of Title 18, United States Code, as well as regulatory matters falling within the jurisdiction of the Federal Communications Commission.¹⁶

CONCLUSION

The use of c-UAS equipment raises a number of novel and complex technical, legal, and policy issues. The interrelated and complex nature of these issues make it imperative that deployment of c-UAS equipment and further expansions of c-UAS authority be carefully scoped and calibrated to ensure aviation safety, reliability of the air navigation infrastructure, and the protection of lawful uses of the NAS. Addressing these issues will require careful consideration by Congress and ongoing coordination among government agencies and interested stakeholders.

¹⁵ Available at: https://www.faa.gov/airports/airport_safety/media/UAS-Counter-Measure-Testing-letter.pdf

¹⁶ Jason Snead, John-Michael Seibler, and David Inserra, “Backgrounder: Establishing a Legal Framework for Counter-Drone Technologies.”, The Heritage Foundation, Apr. 16, 2018. Available at: https://www.heritage.org/sites/default/files/2018-04/BG3305_1.pdf

PARTICIPANT BIOGRAPHIES

Ms. Angela Stubblefield, Deputy Associate Administrator for Security and Hazardous Materials Safety, Federal Aviation Administration

- Ms. Angela Stubblefield graduated from the University of Virginia with a Bachelor of Arts degree in Government and Philosophy and from George Mason University with a Master of Arts degree in Transportation Policy, Operations, and Logistics.
- Ms. Stubblefield served as an active duty U.S. Marine and worked as a civilian intelligence analyst for the U.S. Marine Corps.
- Ms. Stubblefield has 25 years of expertise in threat analysis, emergency operations planning, hazardous materials safety, national security policy, and investigations oversight developed while holding positions in several government agencies including at the FAA, TSA, and the Office of the Secretary of Transportation.

Mr. Steven Mucklow, Special Assistant to the Deputy Assistant Secretary of Defense for Homeland Defense Integration and Defense Support of Civil Authorities

- Mr. Steven Mucklow graduated from the Citadel, the Military College of South Carolina, with a Bachelor of Science degree in Computer Science and earned a Master of Science in Administration from Central Michigan University.
- Mr. Mucklow served as a Surface Warfare Officer with the United States Navy for 30 years culminating in his assignment as the Senior Executive Assistant to the Commander of North American Aerospace Defense Command and U.S. Northern Command.
- In his current role, Mr. Mucklow is responsible for formulation of homeland defense policy positions and the development, coordination, and oversight of the integration and implementation of plans and policy for homeland defense, with emphasis on air, missile, and UAS defense.

Mr. David Silver, Vice President, Civil Aviation, Aerospace Industries Association (AIA)

- Mr. David Silver earned a Bachelor of Science degree in engineering and a Bachelor of Arts degree in political science from Arizona State University as well as a Master of Science degree in Engineering Management from Washington State University.
- Mr. Silver served for 22 years in the Army National Guard as an Engineering Officer, with successive leadership roles culminating in Battalion Command and Assistant G3 for Washington State.
- Before joining AIA, Mr. Silver accrued over 20 years of experienced in Aviation, serving previously as the Director of Engineering and Regulatory Affairs for the Boeing Company in Washington, D.C. where he worked extensively with both regulatory and legislative committee leadership and has vast experience working Airplane Systems for airplane programs such as the 787, 777, and 767.

Mr. Doug Johnson, Vice President, Technology Policy, Consumer Technology Association

- Mr. Doug Johnson is responsible for public policy issues affecting product development, operations, sales and marketing across the consumer technology industry.
- Mr. Johnson serves as an advocate for the industry before regulators and legislators at the local, national and international levels on policy concerning the operation of small

unmanned aerial vehicles (drones), as well as regulatory reform, policy alignment, energy efficiency, and the use of consumer technology devices on aircraft.

Ms. Lisa Ellman, Co-Executive Director, Commercial Drone Alliance

- Ms. Lisa Ellman received a Bachelor of Arts degree in History from the University of Michigan as well as a Juris Doctor and Master of Public Policy from the University of Chicago Law School and Harris School of Public Policy.
- Ms. Ellman chairs the Unmanned Aircraft Systems (UAS) practice at the international law firm Hogan Lovells.
- Ms. Ellman's previous experience includes a variety of high level positions with the executive branch at the White House and the U.S. Department of Justice (DOJ), where she recently led the DOJ's effort to develop policy to govern the use of UAS in the United States.