



**The Journal of Robotics,
Artificial Intelligence & Law**

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Editorial Office

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Articles and Submissions

Direct editorial inquires and send material for publication to:

Steven A. Meyerowitz, Editor-in-Chief, Meyerowitz Communications Inc.,
26910 Grand Central Parkway, #18R, Floral Park, NY 11005, smeyerowitz@
meyerowitzcommunications.com, 646.539.8300.

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Morgan Morrisette Wright, Publisher, Full Court Press at mwright@fastcase.com
or at 202.999.4878

For questions or Sales and Customer Service:

Customer Service
Available 8am–8pm Eastern Time
866.773.2782 (phone)
support@fastcase.com (email)

Sales
202.999.4777 (phone)
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Recent Regulatory Initiatives for Unmanned Aircraft Systems Operations

Elaine D. Solomon*

The Department of Transportation recently announced two Federal Aviation Administration rulemaking proposals: (1) a draft Notice of Proposed Rulemaking that addresses unmanned aircraft systems flights over people and at night—without the need for a waiver or exemption, if certain conditions are met; and (2) a draft Advance Notice of Proposed Rulemaking, which addresses major drone safety and security issues that may pose a threat to other aircraft, people on the ground, or national security. The author of this article discusses these and other regulatory initiatives for unmanned aircraft systems operations.

In August 2016, the Federal Aviation Administration (“FAA”) promulgated new Part 107 regulations¹ concerning small Unmanned Aircraft Systems (“sUAS”) (popularly known as drones), thus allowing expanded use of drones for commercial purposes in the United States. Although those regulations were somewhat of a boost to the UAS market, everyone has waited with great anticipation for additional FAA regulations that will allow greater flexibility for commercial sUAS operations outside of the restrictions of Part 107, including allowing sUAS operations at night, above people, and/or beyond visual line-of-sight (“BVLOS”). The FAA and the current administration have taken several steps recently toward the ultimate goal of putting a set of regulations in place that will allow expanded commercial and other uses of drones, and will also ensure that drones operate safely and securely in national airspace.

Notice/Advance Notice of Proposed Rulemaking

On January 14, 2019, Department of Transportation (“DOT”) Secretary Elaine Chao announced two FAA rulemaking proposals:² (1) a draft Notice of Proposed Rulemaking (“NPRM”) that addresses

UAS flights over people and at night—without the need for a waiver or exemption, if certain conditions are met; and (2) a draft Advance Notice of Proposed Rulemaking (“ANPRM”), which addresses major drone safety and security issues that may pose a threat to other aircraft, people on the ground, or national security. The latter proposals include a set of restrictions to ensure that drones are operated safely, including required standoff distances, additional operating and performance restrictions, additional payload restrictions, and a drone traffic management system. These draft initiatives will be published in the Federal Register “as soon as possible.” There will then be a 60-day comment period after publication in the Federal Register. These draft rulemakings are in line with the FAA’s performance-based approach to UAS operations, which is “technology neutral.” That means that the FAA does not focus on a particular set of technical, equipment, or technology solutions, but rather, that there is a safe outcome and the overall safety standard is met.

Flights Over People and Night Operations

Currently, UAS flights over people are not permitted without a waiver or exemption.³ UAS “operation over people” is defined as when any sUAS “passes over any part of any person who is not directly participating in the operation and who is not located under a covered structure or inside a stationary vehicle.”⁴ The new proposals are aimed at increasing safety and protecting bystanders. Thus, the operations have to be within or over a closed or restricted access site, and anyone within that site would have to be notified that an sUAS may fly over them. For operations that are not within or over a closed or restricted access site, the sUAS may pass over, but cannot hover over, people.

For operations over people, three categories of UAS operations are proposed based upon the risk of injury the operations present. These include certain design specifications of the UAS, such as weight, the risk of injury, and whether the UAS has exposed sharp edges or blades that could injure a person. There are also manufacturer and operator requirements for each category. The three risk of injury categories (based upon the probability that a direct impact with a person on the ground from an sUAS will cause an injury) include the following:

- *Category 1*—for UAS weighing 0.55 pounds or less, those UAS would be allowed to fly over people under Part 107 without additional requirements.
- *Category 2*—there are no weight parameters for this category; rather, the UAS manufacturer must be able to prove to the FAA that the UAS would not injure a person more severely than if he or she were hit with a rigid object that transferred 11 foot-pounds of kinetic energy in the event of a collision. If that requirement is met, then the UAS can be flown under Part 107 without additional restrictions.
- *Category 3*—this category includes UAS that would not produce an injury to a person who is struck by the UAS more severely than if he or she were struck with a rigid object that transferred 25 foot-pounds of kinetic energy. This category does have additional operating limitations, including that the UAS cannot hover directly over people, cannot operate over an open-air assembly of people, and must be conducted in a restricted access site.

In addition to the above, the NPRM regarding operations over people also includes additional training requirements for UAS pilots,⁵ as well as credential checks. RPICs would be required to present their certificate as well as identification to federal, state, or local officials upon request. There is also a proposal to change the knowledge testing requirements in the rules that apply to sUAS to require training every 24 months.

Current regulations do not allow sUAS operations at night⁶ without a waiver.⁷ According to the FAA, UAS night operations waiver requests are the most popular waiver requests. For UAS night operations, the FAA will require additional knowledge testing and training regarding operation of a UAS at night, and there is a requirement that the UAS be equipped with an anti-collision light that is illuminated and visible for at least three statute miles.⁸

If the proposed rules are ultimately implemented, they would eliminate the need for special waivers for nighttime operations and flights over people, thus allowing for further economic benefits from the growing commercial UAS industry.

While these proposals are welcome steps, the FAA made clear that the final operations over people and night operations rules will not be released until a UAS remote tracking and identification rulemaking process is complete to ensure safety. Remote tracking

and identification regulations are viewed as necessary to deter and address any hazardous or illegal UAS activities, so that UAS are not flown in a manner nor in locations where they are not supposed to be flown. The FAA has stated that UAS remote tracking and identification rules are set for release at some point later this year. The recent government shutdown, however, will no doubt affect this entire rulemaking process.

UAS Safe and Secure ANPRM

The second initiative—the ANPRM—focuses on restrictions to ensure that UAS are operated safely and securely. This new proposal identifies major drone safety and security issues that may pose a threat to other aircraft, people on the ground, or national security. It solicits for consideration recommendations to reduce these risks as drones are integrated into our national airspace. The FAA is seeking comment regarding under what circumstances it should promulgate regulations regarding the following:

- Required standoff distance for certain types of UAS operations versus people and property on the ground, other aircraft, etc.;
- Additional operating and performance restrictions, as well as limitations on altitude and airspeed;
- Use of a UAS traffic management system to add more structure to airspace and operations;
- Additional payload restrictions, because of the concern that UAS could be used for improper, detrimental purposes; and
- sUAS critical design requirements, especially with respect to redundancy requirements for critical systems.

Project to Develop Technology for a UAS Traffic Management System

In conjunction with the two announcements described above, the DOT also took further steps to help develop technology to put a UAS traffic management system in place. In 2018, the DOT selected 10 pilot projects from around the country to test the safe operation of drones in a variety of conditions. The DOT has now

announced that contracts have been awarded to three entities that will develop technology to provide flight planning, communications, separation, and weather services for drones that will operate under 400 feet. This traffic management system will be separate from, but complementary to, the traditional FAA air traffic management system.

The Federal Aviation Authority Reauthorization Act of 2018

The Federal Aviation Authority Reauthorization Act of 2018⁹ (“the Act”) was signed into law on October 5, 2018. One area of the Act includes some important provisions for commercial and recreational drones. With respect to recreational drones, the Act repealed the Special Rule for Model Aircraft (so-called Section 336), such that hobbyist drone pilots are now subject to FAA regulations similar to those applicable to those flying commercial drones. This includes the prohibition against drone flights near airports, and at or above 400 feet. Further, although it is not clear if the FAA will do so, the Act allows the FAA to require hobbyist drone pilots to pass a knowledge and safety test before flying a recreational drone. As set forth in the FAA’s website,¹⁰ the Act imposes the following requirements on recreational drone operators:

- Register the drone;
- Fly for hobby or recreation purposes only;
- Flying within visual line-of-sight of your drone;
- Follow community-based safety guidelines, and fly within the programming of a nationwide community-based organization;
- Fly a drone that weighs less than 55 pounds, unless certified by a community-based organization;
- Never fly near other aircraft; and
- Never fly near emergency response efforts.

Another critical area of the Act gives the Department of Homeland Security the ability to “track,” “disrupt,” “control,” and “seize or otherwise confiscate” any drone that is deemed a “credible threat.” Significantly, the Act does not define “credible threat,” leading some to argue that the Act gives overly broad, unrestricted power to the

government to take down and seize recreational and/or commercial drones. However, given the number of “near misses” or disruptive drone events in the past few years, this power may be viewed as necessary for the advancement of anti-drone technologies, or is a power the government has anyway. The “credible threat” must be to a “covered facility or asset,” not a threat in general airspace. This part of the Act ties in with Section 364 of the Act, which tasks the FAA with reviewing agencies currently authorized to operate Counter-Unmanned Aircraft Systems (“C-UAS”) to coordinate interagency C-UAS activities and standards.

In Section 376 of the Act, the FAA is to put in place a UAS traffic management system, working with NASA and the UAS industry. This is to include expansion of UAS operations beyond visual line-of-sight. A plan is also to be developed to impose remote UAS identification and tracking requirements.

Conclusion

All one has to do is look at some recent events that show the potential of UAS operations to disrupt aviation and the national airspace. In January 2019, at the time of writing this article, someone flew what was reportedly a drone so high and close to Newark Liberty International Airport (one of the nation’s busiest airports) that incoming flights were briefly halted during a peak hour. Two pilots (one from a Southwest Airlines flight and one from a United Airlines flight) reported seeing a drone approximately 3,500 feet (1,000 meters) above Teterboro, New Jersey, which is approximately nine miles (15 kilometers) from Newark Airport. In response, the FAA held up 43 flights already in the air and headed for Newark; nine of those flights landed instead at other airports. Another 170 Newark-bound planes were briefly delayed on the ground before taking off from other airports around the country. The New Jersey State Police and the FBI were alerted.

This incident was similar to two others in the United Kingdom, which also resulted in air traffic disruptions. In mid-December 2018, hundreds of flights were canceled and more than 100,000 people were stranded or delayed over the course of two to three days following reports of drones spotted near the runway at Gatwick Airport. A few days later, police arrested two people living near the airport, who were later cleared. No other suspects have

been identified to date. A few weeks later, another reported drone sighting halted flights departing from London's Heathrow Airport. A criminal investigation was opened, but no one has been charged.

The FAA's new proposals, as well as provisions in the FAA Reauthorization Act of 2018, are necessary to enable the United States to move forward with UAS innovation and competition, while protecting our national airspace. The latest regulatory efforts are slowly advancing efforts to increase the use of drones for commercial and other purposes, while also balancing the need for safety and security.

Notes

* Elaine D. Solomon, a partner at Blank Rome LLP and co-chair of the firm's aviation practice, is a member of the Board of Editors of *The Journal of Robotics, Artificial Intelligence & Law*. She concentrates her practice in the areas of aviation law and litigation, product liability, and tort litigation. Ms. Solomon may be contacted at solomon@blankrome.com.

1. 14 C.F.R. Part 107—Small Unmanned Aircraft Systems. *See also* the FAA's Fact Sheet regarding Part 107 at www.faa.gov/uas/media/Part_107_Summary.pdf.

2. For the specifics of the proposals, see the draft content at www.faa.gov/uas/programs_partnerships/DOT_initiatives/.

3. *See* 14 CFR §§ 107.200 and 107.205(g).

4. *See* 81 FR at 4212.

5. *See* 14 CFR § 107.19—Remote Pilot in Command ("RPIC") requirements.

6. 14 CFR § 107.29.

7. 14 CFR § 107.200.

8. A statute mile (5,280 feet) is often used as a measurement in aviation, and is different than a nautical mile, which is approximately 6,076 feet.

9. *See* the Act at www.congress.gov/bill/115th-congress/house-bill/302/text.

10. *See* www.faa.gov/news/updates/?newsID=91844.