



Center for the Study of the Drone

at Bard College

NEED TO KNOW

Significant Aspects of the FAA's Drone Rules

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Credit: Wikimedia Commons

By Arthur Holland Michel

Today, the Federal Aviation Administration [released its much anticipated Part 107 rules](#), which cover the use of

drones for non-recreational purposes in the U.S. airspace system. Up until now, non-recreational drone users such as commercial entities and educational institutions had to apply for a [Section 333 Exemption](#). The [Part 107 rules](#) will effectively open U.S. skies to any operator who completes a certification process. The rules will go into effect as a section of U.S. Federal Aviation Regulations in August 2016.

The Part 107 rules are based on a document called the Notice of Proposed Rule-making (NPRM), which was released in February 2015. This document proposed a comprehensive set of rules, and called for public comments on these rules. Shortly after the publication of the NPRM, we reviewed the lengthy document and [identified 31 questions](#) that the FAA specifically hoped public commenters would weigh in on. These questions highlighted certain potential rules and requirements that were under debate. In response to these and other questions, the FAA received nearly 4,500 public comments. It closely reviewed and evaluated these comments: the result is the final Part 107 rules.

We have reviewed Part 107 to determine how the FAA has resolved these questions based upon comments it received as well as its own internal rule-making process. The original questions, as described in our “31 Questions” post are marked in italics and indicated the relevant page number on the NPRM.

The answers to these questions as reflected by the [Part 107 Summary](#) and the full [Part 107 document](#) are described immediately below each original question. Where page numbers are indicated, they refer to the relevant portion of the full Part 107 document. These questions and their answers provide a useful guide to some of the most significant, complex and highly anticipated facets of the Part 107 rules. The Part 107 rules include a provision that allows operators to apply for a waiver to any of these rules.

How much money would these rules save the U.S. economy? The FAA wants to measure the economic impact of these rules so it can determine whether the benefits of the rule would outweigh the costs of implementing and maintaining it. (p16)

The FAA concluded that this rule “will have will have a significant positive economic impact because it enables new businesses to operate small UAS for hire and will stimulate a manufacturing support industry. The FAA believes that most, if not all, of these new commercial activities will be conducted by operators of small UAS who are small business entities. Therefore, the FAA believes that this final rule will have a positive significant impact on a substantial number of entities.” (p573) The [press release](#) announcing Part 107 states that “according to industry estimates, the rule could generate more than \$82 billion for the U.S. economy and create more than 100,000 new jobs over the next 10 years.” In its “[Aerospace Forecast for 2016-2036](#),” the FAA predicted that the market size for commercial UAS could grow significantly once the regulations go into effect.

Should the FAA have different, less restrictive rules for drones that weigh less than 4.4 pounds? And if it should, are there any risks it should take into account? The FAA has said it is particularly interested in the public's thoughts on this matter. (p59)

Yes. After evaluating numerous public comments both in favor of and against a separate set of less restrictive rules for micro drones, the FAA “determined that a different framework to regulate micro UAS is called for.”

However, the FAA did not include these separate rules in Part 107: “Because the public has not yet been given an opportunity to comment on an alternate framework for micro UAS operations, the FAA has determined that a new comment period should be provided for the micro UAS component of this rule.” (p575) A committee set up by the FAA [recommended that the](#) agency establish a separate rule for micro UAS.

How can the FAA make better use of its six test sites? (p32)

The FAA is going to be more proactive about directing research initiatives on the test sites. “The FAA is working closely with the Test Sites to guide research programs toward specific goals such as System Safety & Data Gathering, Aircraft Certification, Command & Control Link Issues, Control Station Layout & Certification, Ground & Airborne Sense & Avoid, and Environmental Impacts that will help the FAA safely integrate UAS into the national airspace system.” (p500)

Should drones with advanced safety features that mitigate some of the safety concerns underlying the rules be exempt from certain rules? And how should the FAA determine which drones should be exempt?

No. The FAA has not created any separate rules for drones with advanced safety features. All drones and drone operators are subject to the same rules. For example, drones equipped with a “First-person view camera cannot satisfy ‘see-and-avoid’ requirement but can be used as long as requirement is satisfied in other ways.” (Summary of Part 107.) That being said, the FAA will allow operators to apply for waivers to any of the rules. These waivers will be granted on a case-by-case basis, and will likely take into consideration advanced safety features: “Most of the restrictions discussed above are waivable if the applicant demonstrates that his or her operation can safely be conducted under the terms of a certificate of waiver.” For example, in a comment from the Property Drone Consortium stating that “that any UAS with ‘special safety features’ should be exempt from the ban on flight over non-participants.” The FAA states that “the restriction on flight over people in this rule will be waivable.” (p261)

Should drones be allowed to tow objects? (p40)

Yes. As long as the total weight of the drone plus the cargo does not exceed 55 pounds and no hazardous materials are transported, drones will be permitted to carry property. (P320 and Part 107 Summary.)

Should drones registered overseas be allowed to operate in the U.S.? (p44)

Yes. “Foreign-registered small unmanned aircraft are allowed to operate under part 107 if they satisfy the requirements of part 375.” (Part 107 Summary.) Furthermore, “foreign certificated UAS pilots will be required to obtain an FAA issued remote pilot certificate with a small UAS rating.” (p11-12)

A cornerstone of the proposed rules is the requirement that drone pilots maintain a direct line of sight with the drone at all times, but many have claimed that this rule would significantly restrict drone applications. So, is there any reason why this requirement should be lifted, and if so, how could it be lifted while keeping operations safe? (p13)

No. The FAA is not lifting its proposed ban on beyond visual line of sight operations. “Visual line-of-sight (VLOS) only; the unmanned aircraft must remain within VLOS of the remote pilot in command and the person manipulating the flight controls of the small UAS. Alternatively, the unmanned aircraft must remain within VLOS

of the visual observer.” (Part 107 Summary)

Should the rules require that very small drones be made out of materials that shatter on impact, thus reducing harm to people if they are struck by one? (p58)

Possibly. This will be determined in the separate micro drone rules.

The FAA allows the Pilot in Command of manned aircraft to break certain flight rules during an emergency situation. Should drone operators be granted the same permission? (The FAA thinks not.) (p62)

Yes. “This rule will allow the remote pilot in command to deviate from the provisions of part 107 to the extent necessary to respond to that emergency.” (p114)

Certain drone flight will require a second person to act as a visual observer, to help the pilot track the drone. Should this visual observer be required to remain within shouting distance of the pilot? (p65)

Not necessarily. No visual observer will be required. When one is present, however, the rule will simply require that the drone operator and the visual observer maintain “effective” communication. “This rule will require the remote pilot in command, the person manipulating the flight controls of the small UAS (if that person is not the remote pilot in command), and the visual observer to maintain effective communication, but it will also allow the remote pilot in command to determine how that communication will take place.” (p144)

Should the visual observer be required to get certification? (Pilots will need to be certified). (p66)

No. Since a visual observer is not required, and since the visual observer is not responsible for the drone (that falls to the operator) no certification is required for the visual observer. (p153)

The proposed rules do not allow operators to use First Person View systems to get around the requirement that the pilot be able to see the drones with the naked eye at all times? But are there any ways that FPV could be used safely in the place of line-of-sight? And should the FAA be open to granting exemptions to its naked eye requirement once FPV technology gets better? (p70)

No. First Person View systems may be used to supplement the visual line of sight, but they may not be used in place of the visual line of sight. (Part 107 Summary)

The proposed rules would not require a maximum boundary for the area within which a pilot can fly a drone, but should it? And if so, what should that limit be? (p76)

No. The rule does not create a strict boundary for operations. The FAA reasons that the line of sight requirement will create a natural boundary for operations. (p210)

Should the FAA allow drones to be launched and operated from cars? The proposed rules would not permit this, but they would permit the operation of drones from boats. (p77)

No, except under limited circumstances such as operations in sparsely populated areas. “This rule will maintain the proposed prohibition on operating a small UAS from a moving aircraft. This rule will, however, allow operation of a small UAS from a moving land-based or water-borne vehicle if the small unmanned aircraft is flown over a sparsely populated area. The prohibition against operating a small UAS from an aircraft

and the limitations on operations from moving vehicles will be waivable as long as the small unmanned aircraft is not transporting another person's property for compensation or hire." (p211)

Is the proposed 500 ft. ceiling for all drone flights too high or too low, or is it just right? (p79)

The rule will limit flights to 400 feet above ground level, unless the drone is operated near a tall structure (this is because no manned aircraft will be flying near a manned structure. "Maximum altitude of 400 feet above ground level (AGL) or, if higher than 400 feet AGL, remain within 400 feet of a structure." (Part 107 Summary)

Should there be a speed limit for drones? The FAA thinks it should be 100 mph. (p80)

Yes. The maximum speed for all drones flights will be 100 mph. (Part 107 Summary)

Should 16 year old be allowed to apply for a drone pilot certificate? Would reducing the minimum age expand the academic use of drones? (p98)

Yes. The NPRM proposed a minimum age of 17, but the final rules have lowered the minimum age to 16. (Part 107 Summary)

Should drone operators be required to demonstrate flight proficiency and aeronautical knowledge? (p103)

Yes. "To qualify for a remote pilot certificate, a person must: Demonstrate aeronautical knowledge by either: Passing an initial aeronautical knowledge test at an FAA-approved knowledge testing center; or Hold a part 61 pilot certificate other than student pilot, complete a flight review within the previous 24 months, and complete a small UAS online training course provided by the FAA." (Part 107 Summary)

The FAA proposes a knowledge test for certification to fly drones, but should a training course be required instead? (p104)

No, a training course will not be required. "A prescriptive formal training requirement is not necessary in this rule. Instead, this rule will allow remote pilot certificate applicants to attain the necessary aeronautical knowledge through any number of different methods, including self-study, enrolling in a training seminar or online course, or through one-on-one instruction with a trainer familiar with small UAS operations and part 107." (p406)

What areas should the knowledge test cover? In other words, what do drone operators need to be tested on? (p107)

The test will cover "(1) regulations applicable to small UAS operations; (2) airspace classification and operating requirements...and flight restrictions affecting small unmanned aircraft operation; (3) official sources of weather and effects of weather on small unmanned aircraft performance; (4) small UAS loading and performance; (5) emergency procedures; (6) crew resource management; (7) radio communication procedures; (8) determining the performance of small unmanned aircraft; (9) physiological effects of drugs and alcohol; (10) aeronautical decision-making and judgment; and (11) airport operations" in addition to "maintenance and inspection procedures." (p419)

Should drone pilot licenses expire after a certain amount of time? And if so, when should they expire? (p114)

Certificates will be permanent. (Part 107 Summary)

Should drones have to display their registration number according to the requirements for manned aircraft, or should they get their own set of display requirements (that is, font size, color, etc)? (p130)

Yes. Per the registration rule for drones, operators will be required to mark their airframes with their registration number.

What kinds of accidents and incidents should drone operators report to the FAA? If an accident only causes minimal property damage or injury, should it be reported, or forgotten? (p134)

Operators must “report to the FAA within 10 days of any operation that results in at least serious injury, loss of consciousness, or property damage of at least \$500.” Part 107 Summary

Should we be allowed to use drones to transport and deliver goods? (p40)

Yes, as long as the total weight of the drone plus the goods does not exceed 55 pounds, and as long as no hazardous materials are transported. (Part 107 Summary)

The proposed rules would prohibit the use of drones at night. Is there any reason the FAA should reconsider this rule. If so, how could pilots ensure that nighttime operations are safe? (p71)

Nighttime operations will not be permitted unless operators obtain a waiver. “This rule will maintain the prohibition on nighttime operations but will allow small UAS operations to be conducted during civil twilight if the small unmanned aircraft has lighted anti-collision lighting visible for at least 3 statute miles. The nighttime-operations prohibition in this rule will also be waivable.” (p159)

Should drone pilots have to pass a medical test? (p116)

No. “This rule will not require an airman medical certificate but will prohibit a person from manipulating the flight controls of a small UAS or acting as a remote pilot in command or visual observer if he or she knows or has reason to know that he or she has a physical or mental condition that would interfere with the safe operation of a small UAS.” (p396)

Should there be a blanket rule for all drones under 55 pounds, or should there be separate rules based on weight of the drones (i.e. stricter rules for heavier drones)? (p54)

There will be two sets of rules: one for drones between 4.4 pounds and 55 pounds, and one for drones under 4.4 pounds. The micro drone rule (under 4.4 pounds) will be announced at a later date.

Though our original post did not directly refer to issues relating to privacy in the NPRM, the FAA has acknowledged certain privacy considerations in its rulemaking for Part 107. It received over 180 public comments about privacy. The FAA has determined that it will not include privacy related rules in Part 107 because “its mission is to provide the safest, most efficient aerospace system in the world, and does not include regulating privacy. The FAA recognizes that unique characteristics and capabilities of UAS may pose risks to individual privacy. However, these concerns are generally related to technology and equipment, which

may be installed on an unmanned (or manned) aircraft, but are unrelated to the safe flight of the aircraft.”
(p529)

Furthermore, the FAA received many comments relating to the use of drones over people (the NPRM proposed to prohibit flights over individuals not involved in the operation of the drone. The FAA has maintained this restriction in the final Part 107 rules.

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1 comment for “Significant Aspects of the FAA’s Drone Rules”

Richard

July 1, 2016 at 08:27

Let’s say I’m doing a job for a realtor and we intend to do a fly around of the property. We would have to fly over neighbors houses to do this. Would we have to wait until the neighbor mowing his grass finishes before we fly over his back yard???

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