



VIA FDMS

The Honorable Michael P. Huerta
Administrator
Office of the Administrator
Federal Aviation Administration
800 Independence Avenue SW
Washington, DC 20591

July 9, 2014

Re: Amazon Petition for Exemption

Dear Administrator Huerta:

At Amazon, our energy comes from inventing on behalf of customers. Amazon Prime Air, a new delivery system that will get packages to customers in 30 minutes or less using aerial vehicles, is one invention we are incredibly passionate about. We believe customers will love it, and we are committed to making Prime Air available to customers worldwide as soon as we are permitted to do so.

Amazon shares Congress's goal of getting small aerial vehicles (a.k.a., small unmanned aircraft systems, or "sUAS") flying commercially in the United States safely and soon. In the FAA Modernization and Reform Act of 2012, Congress directed the FAA "to safely accelerate the integration of civil unmanned aircraft systems into the national airspace system" and, under Section 333 of that law, gave the FAA power to grant innovators "expedited operational authorization" to do so. By this petition, Amazon is seeking its first such authorization, in order to conduct additional research and development for Prime Air.

We are rapidly experimenting and iterating on Prime Air inside our next generation research and development lab in Seattle. In the past five months, we have made advancements toward the development of highly-automated aerial vehicles for Prime Air, including:

- Testing a range of capabilities for our eighth- and ninth-generation aerial vehicles, including agility, flight duration, redundancy, and sense-and-avoid sensors and algorithms;
- Developing aerial vehicles that travel over 50 miles per hour, and will carry 5-pound payloads, which cover 86% of products sold on Amazon; and

- Attracting a growing team of world-renowned roboticists, scientists, aeronautical engineers, remote sensing experts, and a former NASA astronaut.

Current FAA rules allow hobbyists and manufacturers of model aircraft wide latitude in flying their sUAS outdoors. Because Amazon is a commercial enterprise we have been limited to conducting R&D flights indoors or in other countries. Of course, Amazon would prefer to keep the focus, jobs, and investment of this important research and development initiative in the United States by conducting private research and development operations outdoors near Seattle – where our next generation R&D lab and distinguished team of engineers, scientists and aeronautical professionals are located. In order to allow outdoor R&D testing for Prime Air in the United States, we are submitting this petition for exemption pursuant to Section 333 of the FAA Modernization and Reform Act of 2012.

Granting Amazon an exemption to allow R&D testing outdoors in the United States is in the public interest because it advances Congress's goal of getting commercial sUAS flying in the United States safely and soon. It is a necessary step towards realizing the consumer benefits of Amazon Prime Air and, at this point, Amazon's continuing innovation in the United States requires the requested exemption for outdoor testing in support of our R&D.

Further, granting this request will do nothing more than allow Amazon to do what thousands of hobbyists and manufacturers of model aircraft do every day, and we will abide by much stronger safety measures than currently required for these groups by FAA policies and regulations. In this petition for exemption, we seek to engage in essentially the same type of sUAS operation that the FAA would permit us to currently – but for the fact that Amazon is not a hobbyist or manufacturer of a model aircraft.

One day, seeing Amazon Prime Air will be as normal as seeing mail trucks on the road today, resulting in enormous benefits for consumers across the nation. We respectfully submit this petition for exemption so that Prime Air can be ready to launch commercial operations as soon as eventually permitted by subsequent FAA action.

Information Supporting this Petition as Specified in 14 C.F.R. §11.81

(a) Mailing address and other contact information such as a fax number, telephone number, or e-mail address

Amazon.com
Legal Department
Re: Prime Air Exemption Petition
440 Terry Ave. North
Seattle, WA 98109
Fax: 206-266-7010
Email: prime-air-exemption@amazon.com

(b) The specific section or sections of 14 C.F.R. from which Amazon seeks an exemption

- 14 C.F.R. § 21.191(a) – *Experimental Certificates*
- 14 C.F.R. § 45.23(b) – *Display of marks; general*
- 14 C.F.R. § 91.9(b) – *Civil aircraft flight manual, marking, and placard requirements*
- 14 C.F.R. § 91.203(a) and (b) – *Civil Aircraft: Certifications Required*

We believe an exemption from the regulations noted above will be sufficient to conduct the R&D described in this exemption request. To the extent that FAA may deem it necessary, however, we also request an exemption from any regulations ancillary to the foregoing that may be needed to facilitate the desired operations.¹

(c) The extent of relief Amazon seeks, and the reason Amazon seeks the relief

We seek an exemption from several interrelated provisions of 14 C.F.R. Parts 21, 45 and 91 to the extent necessary to engage in private, non-commercial R&D operations of sUAS on our own property that would otherwise be expressly permitted if conducted by a hobbyist or a

¹ Given the nature of the specific relief sought by this exemption request under 14 C.F.R. §§ 21.191(a), 45.23(b), 91.9(b) and 91.203(a) and (b), and the particular contours of our desired testing operations and proposed safeguards, a request for relief from any associated or implementing requirements of several related provisions that may otherwise be applicable, such as 14 C.F.R. §§ 91.7(a) (civil aircraft airworthiness); 91.103(b) (pre-flight action); 91.109 (flight instruction); 91.119 (minimum safe altitudes); 91.121 (altimeter settings); 91.151(a) (fuel requirements in VFR conditions); 91.405(a) (maintenance required); 91.407(a)(1) (operation after maintenance, preventative maintenance, rebuilding, or alteration); 91.409(a)(2) (inspections); and 91.417(a) and (b) (maintenance records), should either be unnecessary as moot or deemed incorporated herein. Nevertheless, we seek an exemption from any such specific provisions to the extent FAA finds it necessary to grant this request.

manufacturer producing such sUAS.² We have detailed, below, a significant set of safeguards that will apply to these R&D operations. Operations under these safeguards will provide for a level of safety exceeding the level of safety required of similar sUAS operations that FAA authorizes currently and without requiring compliance with the regulations from which we seek an exemption. Moreover, our operations will not “create a hazard to users of the national airspace system or the public or pose a threat to national security”³ and are thus consistent with the congressional mandate in Section 333 of the FAA Modernization and Reform Act of 2012, which gives FAA a mechanism to allow certain UAS to operate safely in the national airspace system.

We also intend to use one or more of the six FAA-selected test sites and seek a special airworthiness certificate (experimental category) for our sUAS. However, it would be impractical for Amazon to pursue either one of these avenues as our sole or even primary method of R&D testing at this time, and doing so would unnecessarily tax scarce FAA resources. For example, it would be an unreasonable burden on both the FAA and Amazon if we were required to apply for a special airworthiness certificate for every sUAS design or testing configuration while we are in R&D and conducting rapid prototyping.

(d) The reasons why granting Amazon’s request would be in the public interest; that is, how it would benefit the public as a whole

As described above, Prime Air will be a new delivery system that is poised to offer enormous consumer benefits by delivering packages to customers in 30 minutes or less. Please see the introduction for details on how granting this request would benefit the public.

(e) The reasons why granting the exemption would not adversely affect safety, or how the exemption would provide a level of safety at least equal to that provided by the rule from which Amazon seeks the exemption

Our R&D operations will provide for a level of safety that far exceeds the level of safety required by FAA for hobbyists and manufacturers of model aircraft.⁴ The following operating procedures will apply during the R&D testing conducted under this exemption request:

² See Pub. L. No. 112-95, § 336, 126 Stat. 77-78.

³ See *id.*, § 333, 126 Stat. 76.

⁴ Because Amazon’s desired testing operations could not possibly be conducted using conventional aircraft, the level of safety required of hobbyists and manufacturers of model aircraft is the appropriate comparison.

- The sUAS will (i) have a maximum weight of less than 55 pounds; (ii) be rotor-powered via a battery source; and (iii) be U.S.-registered and display marks in accordance with 14 C.F.R. Part 45, Subpart C.⁵
- Our sUAS R&D testing under this exemption will be conducted (i) within the visual line of sight of the operator and/or one or more observers; (ii) at less than 400 feet AGL; and (iii) within Class G airspace.
- The operations will be conducted in a confined area over isolated Amazon private property located a sufficient distance away from (i) any airport, heliport, seaplane base, spaceport or other location with aviation activities; (ii) any densely populated areas; and (iii) any military or U.S. government installations or airfields.⁶
- All operations will remain within the lateral and vertical boundaries of the operating area, taking into account all factors, including wind, gross weight and glide distances, that may affect the capability of the sUAS to remain within the airspace boundary; moreover, the integrity of the operating area will be reinforced by geo-fencing,⁷ including the ceiling height of no more than 400 feet AGL.
- Our sUAS R&D testing under this exemption will be conducted (i) under the supervision of a designated pilot in command (PIC) who has final responsibility for the operation in accordance with 14 C.F.R. § 91.3 and either (A) holds a current FAA private pilot certificate issued under 14 C.F.R. Part 61, Subpart E, a higher FAA pilot certification, or a FAA-recognized equivalent⁸ or (B) has completed FAA private pilot ground instruction and passed the FAA private pilot written

⁵ To the extent that FAA determines that the Amazon sUAS operating under this exemption must bear an “experimental” marking, we seek an exemption from 14 C.F.R. § 45.23(b) to accommodate the required markings pursuant to 14 C.F.R. § 45.29(f).

⁶ We will apply separately for the necessary certificates of waiver from the requirements of 14 C.F.R. §§ 91.113 and 91.119 and the associated airspace authorization. Specific details of the operating area, including latitude and longitude, and aeronautical charts and/or photographs, will be provided in conjunction with that application process.

⁷ Geo-fencing is a feature in a software program that uses GPS or radio frequency triangulation to define geographical boundaries. A geo-fence is a virtual barrier – effectively an electronic box in which the sUAS will be confined.

⁸ A private pilot certificate should be sufficient for the PIC to conduct these research and development sUAS flights. See 14 C.F.R. § 61.113(b).

examination or FAA-recognized equivalent; and (ii) using only operators that have completed training on the normal, abnormal, and emergency procedures in specific details and demonstrated proficiency with the sUAS being operated.

- No operator or observer will engage in, nor may an operator or observer permit, any activity during a critical phase of flight which could distract any operator or observer from the performance of his/her duties or interfere in any way with the proper conduct of his/her duties.
- Operators will maintain the sUAS system in a condition for safe operation, and conduct a pre-flight inspection prior to each flight so as to ensure that the sUAS, control station, data link equipment, payload, and support equipment are in a condition for safe operation and in a configuration appropriate for the purpose of the intended flight.
- The operators and observers will maintain two-way communications with each other during all operations; if unable to maintain two-way communications, or if any condition occurs that may otherwise cause the operation to be unsafe, the operator will immediately conclude the operation.
- Each sUAS will safely stop operating and return automatically to a specific location on Amazon's private property if the communications link is lost.
- For each sUAS, the observer will have the ability to press a physical button, that will be within his/her reach at all times, that reduces power to the vehicle so as to force a controlled landing; both the hardware and communication for this safety system will be physically separate from the sUAS flight control systems.
- Testing operations will be conducted on private property, and only Amazon employees, contract personnel, and invitees will be invited to the operations area; security measures will be put in place to deter unauthorized access.
- The aircraft documentation required by 14 C.F.R. §§ 91.9 and 91.203(b), as applicable, will be available to the PIC referred to above at any time Amazon's sUAS are operating.

We will effectively operate our own private model airplane field, but with additional safeguards that go far beyond those that FAA has long-held provide a sufficient level of safety for public model airplane fields – and only with sUAS. Indeed, the combination of the geo-fencing and lost-

link procedures described above will ensure the sUAS stays within the tightly defined operating area within our private property.

(f) A summary FAA can publish in the FEDERAL REGISTER, stating: (1) The rule from which you seek the exemption; and (2) A brief description of the nature of the exemption you seek

Petitioner: Amazon.com, Inc.

Sections of 14 C.F.R. Affected: §§ 21.191(a); 45.23(b); 91.9(b); and 91.203(a) and (b)

Description of Relief Sought: Petitioner seeks relief from the requirements of 14 C.F.R. §§ 21.191(a); 45.23(b); 91.9(b); and 91.203(a) and (b) to conduct private, non-commercial small unmanned aircraft systems (sUAS) operations on its own property subject to operating procedures that meet or exceed those that FAA requires for similar operations.

(g) Any additional information, views or arguments available to support your request


Please see the introduction to this exemption request.

(h) If you want to exercise the privileges of your exemption outside of the United States, the reason why you need to do so.

The research and development operations described in this exemption request will be conducted wholly within the United States.

Please do not hesitate to contact me via email at prime-air-exemption@amazon.com if you have any questions or concerns.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Paul E. Misener".

Paul Misener
Vice President, Global Public Policy
Amazon.com