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October 23, 2014

U.S. Department of Transportation
Docket Management System
1200 New Jersey Ave., SE
Washington, DC 20590

Shotwell Media, LLC's Petition for Exemption to Operate

Unmanned Aircraft Systems for Aerial Photography and Filming

FAA Regulatory Docket

NAME AND ADDRESS OF PETITIONER

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I. PETITION SUMMARY

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95 (2012), 126 Stat. 11 ("Section 333") and the Federal Aviation Administration's ("FAA") general exemption authority under 49 U.S.C. § 44701(f), Shotwell Media, LLC ("Petitioner") hereby petitions for exemptions from 14 C.F.R. Part 21, 14 C.F.R. §§ 61.113(a) and (b), 61.133(a), 91.7(a), 91.9(b)(2), 91.103(b)(1), 91.119(c), 91.121, 91.151, 91.203(a) and (b), 91.405(a), 91.407(a)(1) 91.409(a)(2), 91.417(a)-(b). The proposed exemptions, if granted, would allow Petitioner to operate small, camera-mounted unmanned aircraft systems ("UAS") weighing 55 pounds or less for the purpose of closed-set filming and aerial photography.

Based on the small size of Petitioner's UAS, the qualifications and experience of Petitioner's UAS operators, and the restricted, sterile environment within which Petitioner will operate, the requested exemptions fall squarely within the zone of safety envisioned by Congress and set forth in Section 333. Additionally, the enhanced safety achieved by replacing significantly larger manned aircraft carrying crew and flammable fuel with small UAS carrying no passengers or crew and operated under the specific guidelines and procedures proposed by Petitioner gives the FAA good cause to find that the UAS operations enabled by the instant Petition are in the public interest. Thus, the requested exemptions should be granted.

II. STATUTORY AUTHORITY

A. Section 333

Section 333, titled "Special Rules for Certain Unmanned Aircraft Systems," provides a mechanism for seeking expedited FAA authorization of safe civil UAS operations in the National Airspace System ("NAS"). Section 333(a) states that the FAA "shall determine if certain unmanned aircraft systems may operate safely in the national airspace system before completion of the [comprehensive] plan and rulemaking required by section 332(b)(1) of this Act or the guidance required by section 334 of this Act." In Section 332(b)(1), Congress made it clear that Section 333 provides a mechanism for "expedited operational authorization." The FAA has committed to complying with this mandate by granting several petitions almost identical to the one at hand. *See, e.g.*, Exemption No. 11062, Regulatory Docket No. FAA-2014-0352 (granting regulatory exemptions to Astraeus Aerial for operation of unmanned aircraft systems for the purpose of filming for the motion picture and television industry).

Section 333(b) identifies several factors that the FAA should consider in determining whether commercial UAS operations should be approved. These include UAS that, "as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the [NAS] or the public or pose a threat to national security." *See* Section 333(b).

B. Section 44701(f)

In addition to the specific authority conferred by Section 333, the FAA Administrator has general authority to grant exemptions from the FAA's safety regulations and minimum standards when the Administrator decides a requested exemption is in the public interest. *See* U.S.C. § 44701(f).

III. REQUESTED EXEMPTIONS

Petitioner requests relief from the following regulations:

Part 21 prescribes, in pertinent part, the procedural requirements for issuing and changing design approvals, production approvals, airworthiness certificates, and airworthiness approvals.

Section 61.113 prescribes that "no person who holds a private pilot certificate may act as a pilot in command of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as pilot in command of an aircraft," (*see* Section 61.113(a)), and that "a private pilot may, for compensation or hire, act as pilot in command of an aircraft in connection with any business or employment if: (1) The flight is only incidental to that business or employment; and (2) The aircraft does not carry passengers or property for compensation or hire," (*see* Section 61.113(b)).

Section 61.133(a) sets forth privileges for persons holding commercial pilot certificates, including a provision impliedly limiting to persons holding a commercial

pilot certificate the ability to act as pilot in command of an aircraft "[f]or compensation or hire."

Section 91.7(a) prescribes, in pertinent part, that no person may operate a civil aircraft unless it is in an airworthy condition.

Section 91.9(b)(2) prohibits operation of U.S. registered civil aircraft unless there is available in the aircraft a current approved Airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

Section 91.103(b)(1) prescribes, in pertinent part, that each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight, to include, "For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:… For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein."

Section 91.119(c) prescribes that, except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes: "Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure."

Section 91.121 requires, in pertinent part, each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "to the elevation of the departure airport or an appropriate altimeter setting available before departure."

Section 91.151(a) prescribes that no person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, (1) during the day, to fly after that for at least 30 minutes; or (2) at night, to fly after that for at least 45 minutes.

Section 91.203 prohibits, in subpart (a), any person from operating a civil aircraft unless it has within it (1) an appropriate and current airworthiness certificate; and (2) an effective U.S. registration certificate issued to its owner or, for operation within the United States, the second copy of the Aircraft Registration Application as provided for in § 47.31(c). Section 91.203 prescribes, in subpart (b), that no person may operate a civil aircraft unless the airworthiness certificate or a special flight authorization issued under § 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

Section 91.405(a) requires, in pertinent part, that an aircraft operator or owner shall have the aircraft inspected as prescribed in subpart E of the same part and shall, between required inspections, except as provided in paragraph (c) of the same section, have discrepancies repaired as prescribed in Part 43 of the chapter.

Section 91.407(a)(1) prohibits, in pertinent part, any person from operating an aircraft that has undergone maintenance, preventative maintenance, rebuilding, or alteration unless it has been approved for return to service by a person authorized under § 43.7 of the same chapter.

Section 91.409(a)(2) prescribes, in pertinent part, that no person may operate an aircraft unless, within the preceding 12 calendar months, it has had an inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.

Section 91.417(a) and (b) prescribes, in pertinent part, that-

(a) Each registered owner or operator shall keep the following records for the periods specified in paragraph (b) of this section:

(1) Records of the maintenance, preventative maintenance, and alteration and records of the 100-hour, annual, progressive, and other required or approved inspections, as appropriate, for each aircraft (including the airframe) and each engine, propeller, rotor, and appliance of an aircraft. The records must include-

(i) A description (or reference to data acceptable to the Administrator) of the work performed; and

(ii) The date of completion of the work performed; and

(iii) The signature, and certificate number of the person approving the aircraft for return to service.

(2) Records containing the following information:

(i) The total time in service of the airframe, each engine, each propeller, and each rotor.

(ii) The current status of life-limited parts of each airframe, engine, propeller, rotor, and appliance.

(iii) The time since last overhaul of all items installed on the aircraft which are required to be overhauled on a specified time basis.

(iv) The current inspection status of the aircraft, including the time since the last inspection required by the inspection program under which the aircraft and its appliances are maintained.

(v) The current status of applicable airworthiness directives (AD) and safety directives including, for each, the method of compliance, the AD or safety directive number and revisions date. If the AD or safety directive involves recurring action, the time and date when the next action is required.

(vi) Copies of the forms prescribed by § 43.9(d) of this chapter for each major alteration to the airframe and currently installed engines, rotors, propellers, and appliances.

(b) The owner or operator shall retain the following records for the periods prescribed:

(1) The records specified in paragraph (a)(1) of this section shall be retained until the work is repeated or superseded by other work or for 1 year after the work is performed.

(2) The records specified in paragraph (a)(2) of this section shall be retained and transferred with the aircraft at the time the aircraft is sold.

(3) A list of defects furnished to a registered owner or operator under § 43.11 of this chapter shall be retained until the defects are repaired and the aircraft is approved for return to service.

IV. PETITIONER'S PROPOSED OPERATIONS SATISFY SECTION 333.

A. Unmanned Aircraft System

The UAS to be operated under this request are less than 55 lbs. fully loaded, will be operated at a speed of no more than 50 knots, carry neither a pilot nor passenger, carry no explosive materials or flammable liquids, and operate exclusively within a secured

area. Petitioner's UAS use a radio frequency spectrum for operation and control that complies with Federal Communications Commission ("FCC") requirements, and Petitioner has integrated safety features into the UAS, as described in Petitioner's Flight Operations and Procedures Manual ("FOPM") and Motion Picture and Television Flight Operation Manual ("MPTFOM") (collectively, "operations manuals").[1]

Petitioner's UAS are equipped with redundant safety mechanisms allowing them to operate safely after experiencing certain in-flight failures. If a lost-link event occurs, including the loss of ground communications and/or the loss of a GPS signal, Petitioner's UAS have the ability to perform a pre-coordinated, predictable, automated flight maneuver and return to a predetermined location within a designated security perimeter for landing. The UAS further have the ability to abort a flight in the event of unpredicted obstacles or emergencies. All flights will be terminated after a maximum of 30 minutes or with 25% remaining battery power, whichever occurs first. Thus, good cause exists for granting Petitioner's requested relief from 14 C.F.R. § 91.151(a) (setting forth fuel requirements for flight in VFR conditions).

[1] The MPTFOM and FOPM will be submitted separately and confidentially under 14 C.F.R. 11.35(b), as the manuals contain proprietary information that the applicant has not and will not share with others. The manuals contain operating conditions and procedures that are not available to the public and are protected from release under the Freedom of Information Act, 5 U.S.C. §§ 552, et seq.

Petitioner's UAS will be identified by serial number, registered in accordance with 14 C.F.R. Part 47, and have identification (N-Number) markings in accordance with 14 C.F.R. Part 45, Subpart C. Markings will be as large as practicable.

Regarding Petitioner's requested relief from 14 C.F.R. § 91.121 (Altimeter Settings), Petitioner seeks such relief because Petitioner will not have a typical barometric altimeter onboard the UAS. Instead, altitude information will be provided to the UAS PIC via a digitally encoded telemetric data feed, which downlinks from the aircraft to a ground-based on-screen display. The altitude information will be generated by equipment installed onboard the UAS, using GPS triangulation, digitally encoded barometric altimeter, radio altimeter, or any combination thereof. Prior to each flight, a zero altitude initiation point will be established and confirmed for accuracy by the UAS PIC. Thus, good cause exists for granting the requested relief from 14 C.F.R. § 91.121.

Given the size, weight, speed, and limited operating area associated with the aircraft to be utilized by the applicant, an exemption from 14 C.F.R. Part 21, Subpart H (Airworthiness Certificates), subject to certain conditions and limitations, is warranted (if necessary) and meets the requirements for an equivalent level of safety under 14 C.F.R. Part 11 and Section 333. The UAS operated without an airworthiness certificate in the restricted environment and under the conditions and limitations proposed by Petitioner will be at least as safe, or safer, than a conventional aircraft (fixed wing or rotorcraft)

operating with an airworthiness certificate issued under 14 C.F.R. Part 21, Subpart H, and not subject to the proposed limitations and conditions.

Petitioner will strictly comply with safety and maintenance procedures included in all applicable UAS manufacturer's instructions and operating manuals. To the extent such information is not included in the guidelines developed by the manufacturers, Petitioners will develop and document maintenance, overhaul, replacement, and inspection requirements, procedures to document and maintain maintenance records with regard to Petitioner's UAS, and UAS technician qualification criteria. Petitioner's operations manuals will include maintenance requirements for Petitioner's UAS, including "on-condition" maintenance and modifications. In light of these mitigating factors, exemptions from 14 C.F.R. §§ 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b) are warranted.

B. UAS Pilot in Command

Petitioner's UAS pilot in command (PIC) shall have passed the FAA ground school examination and shall hold at least a third-class medical certificate but shall not be required to hold a current pilot's license. Since there are no standards for either private or commercial UAS pilot certificates, knowledge of airspace regulations acquired from FAA ground school and dexterity in the control and operation of the UAS acquired from actual operation of the aircraft will be the most important factors in establishing an equivalent level of safety. According to the FAA, "the FAA considers the overriding

safety factor for the limited operations proposed by the petitioner to be the airmanship skills acquired through UAS-specific flight cycles, flight time, and specific make and model experience, culminating in verification through testing." *See* Exemption No. 11062, Regulatory Docket No. FAA-2014-0352, at p. 18. With those factors in mind, Petitioner's UAS PIC shall be required to meet several conditions and limitations as outlined in the FOPM and MPTFOM, including the following:

- The UAS PIC will have accumulated and logged a minimum of 200 flight cycles and 25 hours of total time as a UAS rotorcraft pilot and at least 10 hours logged as a UAS pilot with a similar UAS type (single blade or multirotor).
- The UAS PIC will have accumulated and logged a minimum of five hours of flight time with the specific make and model of the UAS to be utilized for operations under the exemption and three take-offs and landings in the preceding 90 days.
- The UAS PIC will have successfully completed the qualification process as specified in the operations manuals, to include a knowledge and skill test.[2]

[2] Prior to operating, the PIC will be required to pass the knowledge and airmanship test qualifications developed by Petitioner for the UAS (which will be included in Petitioner's operations manuals). There are no established practical test standards that support a jurisdictional FAA FSDO ("Flight Standards District Office") evaluation and approval of company designated examiners. Petitioner will conduct these tests in accordance with its operations manuals. Given the constraints of the proposed operations, this procedure for testing will not adversely affect the safety of the NAS.

Regarding Petitioner's requested relief from 14 C.F.R. § 91.7(a), it is Petitioner's understanding that Petitioner's UAS will not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H, and that exemption from 14 C.F.R. § 91.7(a) is therefore unnecessary. To the extent such an exemption is deemed necessary, Petitioner asserts that it should be granted in light of the safety procedures proposed herein. In accordance with the pertinent part of 14 C.F.R. § 91.7(b), the operator in command of Petitioner's UAS shall be responsible for determining whether the aircraft is in a safe condition for flight. Petitioner's manuals for maintenance and operations shall include safety checklists to be used by the operator in command prior to each flight.

Regarding Petitioner's requested relief from 14 C.F.R. § 91.9(b)(2) (Civil aircraft flight manual, marking, and placard requirements) and § 91.203(a) and (b), (Civil aircraft: certifications required), it is Petitioner's understanding that relief from these regulations is no longer necessary in light of the FAA Memorandum "Interpretation regarding whether certain required documents may be kept at an unmanned aircraft's control station," dated August 8, 2014. To the extent the FAA deems an exemption from this section necessary for Petitioner's proposed operations, such exemption should be granted in light of the mitigating fact that Petitioner will maintain the documents required under 14 C.F.R. §§ 91.9 and 91.203 at the UAS ground control station during flights.

Additionally, 100% of Petitioner's operations will utilize a visual observer ("VO"). The VO may be used to satisfy the VLOS requirement as long as the PIC

always maintains VLOS capability. The VO and the PIC will be able to communicate verbally at all times during operational flights.

Regarding Petitioner's requested relief from 14 C.F.R. § 91.103(b)(1), Petitioner will comply with the other applicable procedures and requirements stated in § 91.103(a) and (b). Specifically, the PIC will take all actions including reviewing weather, flight battery requirements, aircraft performance data, and landing and takeoff distances before initiation of a flight. The PIC will also account for all relevant site-specific conditions in their preflight procedures. Risks presented by sun glare will be mitigated by the PIC's and VO's ability to see other air traffic and initiate a return-to-home sequence if needed.

The PIC's UAS operation will be limited to a unique and restricted environment. Given the (1) separation of closed-set filming operations from other manned operations, (2) parallel nature of aeronautical knowledge requirements incumbent in the FAA ground school exam and the process of obtaining a private pilot's license, and (3) the proposed UAS airmanship skills of Petitioner's PICs, the additional manned airmanship experience of a private pilot would not correlate to the airmanship skills necessary for Petitioner's proposed unmanned operations. Thus, Petitioner's request for relief from 14 C.F.R. § 61.113(a) and (b) and § 61.133(a) should be granted.

C. Operating Parameters of Petitioner's UAS

Petitioner's UAS operations will be conducted within a sterile environment of closed-set filming. In this controlled environment, Petitioner's operations will remain

within VLOS of the PIC and VO, below 400 feet AGL, and at speeds below 50 knots. Only participating persons will be permitted within the operating area.[3]

Consistent with the relief typically provided to manned operations under FAA Order 8900.1, Volume 3, Chapter 8, Section 1, Petitioner requests relief from 14 C.F.R. § 91.119(c) with respect to those participating persons, vehicles, and structures directly involved in the performance of the actual filming. Regarding distance from participating persons, the operations manuals set forth safety factors for authorized and consenting production personnel. Because those procedures are specific to participating persons, no further FSDO or aviation safety inspector approval is necessary for reductions to the distances specified in Petitioner's manuals.

Regarding the distance from nonparticipating persons, Petitioner will ensure that no persons are allowed within 500 feet of the operating area except those consenting to be involved and necessary for the filming production, with the possibility of reducing this distance to no less than 200 feet if it would not adversely affect safety and the Administrator has approved it. This is consistent with FAA Order 8900.1, V3, C8, S1.

Petitioner will not conduct UAS operations within 5 nautical miles of the geographic center of a non-towered airport unless a letter of agreement with that airport's management is obtained and the operation is conducted in accordance with a Notice to

[3] Pursuant to Order 8900.1 V3, C8, S1, "participating persons" includes all persons associated with the filming production. Participating persons will be briefed on the potential risk of the proposed flight operations and must acknowledge and accept those risks prior to participation.

Airmen ("NOTAM"). Additionally, Petitioner will not operate in Class B, C, or D airspace without written approval from the FAA. Nor will Petitioner operate the UAS less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.

Petitioner's UAS will remain clear and yield the right of way to all manned operations and activities at all times (including, but not limited to, ultralight vehicles, parachute activities, parasailing activities, and hang gliders).

Although Petitioner seeks to comply with the waiver process as described in FAA Order 8900.1, Volume 3, Chapter 8, Section 1 (Issue a Certificate of Waiver for Motion Picture and Television Filming), the current section of Order 8900.1 has specific processes that preclude a jurisdictional FAA FSDO from issuing the required Certificate of Waiver, because the section did not originally provide for UAS operations. Thus, Petitioner seeks exemption from the applicable regulations normally waived during that process. Petitioner proposes that the FAA include the required notifications and coordination with jurisdictional FSDOs through the conditions and limitations accompanying the requested exemption, and that the exemption sought herein will take the place of the Certificate of Waiver normally issued by a jurisdictional FSDO under 8900.1. Under this rubric, Petitioner will notify every FSDO with jurisdiction over the area that Petitioner plans to operate, just as with manned filming operations, and those

FSDOs will have the ability to coordinate further conditions and limitations with the UAS Integration Office to address any local concerns.

Petitioner will obtain an Air Traffic Organization ("ATO") issued Certificate of Waiver or Authorization ("COA") prior to conducting any operations under this grant of exemption. In fulfilling its requirements under the COA, Petitioner will be required to request a NOTAM not more than 72 hours in advance, but not less than 48 hours prior to the operation.

When applicable, all UAS operations will be conducted in accordance with any state or local privacy laws.

D. The Requested Exemption Promotes the Public Interest

The enhanced safety achieved by replacing significantly larger manned aircraft carrying crew and flammable fuel with small UAS carrying no passengers or crew and operated under the specific guidelines and procedures proposed by Petitioner gives the FAA good cause to find that the UAS operations enabled by the instant Petition are in the public interest. Moreover, as the FAA has already recognized, "UAS provide an additional tool for the filmmaking industry, adding a greater degree of flexibility, which supplements the current capabilities offered by manned aircraft." *See* Exemption No. 11062, Regulatory Docket No. FAA-2014-0352, at p. 22.

V. CONCLUSION

For the foregoing reasons, the regulatory exemptions requested herein should be granted and Petitioner should be permitted to conduct small UAS operations for the purpose of closed-set filming and aerial photography.

Respectfully submitted,

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