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SkyPhilly, Inc.

Section 333 Petition to Operate Small Unmanned Aerial Systems

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Petition Summary:

Pursuant to Section 333 of the FZZ 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. section 44701(f), SkyPhilly ("Petitioner") hereby petitions for exemptions from 14 C.F.R Part 21, Subpart H (Airworthiness Certificates), 14 C.F.R. Part 27 (Airworthiness Standards: Normal Category Rotorcraft), 14 C.F.R sections 61.113(a)-(b), 91.103(b)(1), 91.119(c), 91.121, 91.151, 91.405(a), 91.407(a)(1), 91.409(a)(2), and 91.417(a)-(b).

The proposed exemption, if granted, would allow Petitioner to conduct commercial operations of small unmanned aircraft systems ("UAS") meeting or exceeding all of the operational and safety requirements Congress has set forth in Section 333.

Petitioner is an aviation technology company that plans to exploit the capabilities of Unmanned Aerial Systems to offer a multitude of services, including:

- Aerial surveying
- Remote sensing
- Telecommunications
- Agriculture
- Aerial filmmaking and photography
- Energy systems inspections and asset management
- Construction site inspections and monitoring
- Wildlife and forestry monitoring
- Educational and research operations
- Pipeline inspection and patrolling

Statutory Authority

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 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 operation authorization" if several factors are met. Petitioner meets all requirements to permit FAA approval of commercial UAS operations.

The Petitioner Requests Relief From the Following:

Section 61.113(a) and (b) prescribes that—

(a) 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.

(b) 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.

Section 91.103 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—

(a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC;

(b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:

(1) 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;

(2) For civil aircraft other than those specified in paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.

Section 91.119 prescribes that, except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

(b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

(c) 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.

(d) Helicopters, powered parachutes, and weight-shift-control aircraft. If the operation is conducted without hazard to persons or property on the surface—

(1) A helicopter may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA; and

(2) A powered parachute or weight-shift-control aircraft may be operated at less than the minimums prescribed in paragraph (c) of this section.

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. [emphasis added]

Section 91.405(a) requires, in pertinent part, that an aircraft operator or owner shall have that 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, preventive 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, preventive 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 revision 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.

The Petitioner has Supplied the Following Additional Information:

Pilot S900 Operating Handbook (POH) and S900 User Manual.

Unmanned Aircraft System

The petitioner states that the unmanned aircraft (UA) to be operated under this request is less than 55 lbs. fully loaded, flies at a speed of no more than 50 knots, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a secured area as set out in the POH. The craft is the S900 six-rotor manufactured by DJI. The VTOL hexarotor-type design has six motors, GPS, full autonomous autopilot capabilities, telemetry and manual ground control.

In addition, the craft has integrated safety features built into the design of the UAS, as described in the POH, to ensure the safety of persons and property within and surrounding the limited operating area. The petitioner further describes that, in the event the UAS loses communications or its GPS signal, the UA will have the capability to return to a pre-determined location within the Security Perimeter and land. It will also have the capability to abort a flight in the event of unpredicted obstacles or emergencies.

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.

Pre-flight Inspection, Maintenance

Before each flight the PIC will perform a series of pre-flight and takeoff checks as defined by the POH supplied. After each 60 minutes of airtime, the craft will undergo a thorough inspection of all aircraft components, including, but not limited to:

a. Actuators / Servos

b. Motors, wiring and connectors

c. Propellers, smooth, no chips

d. Electronic speed controller, wiring and connectors

e. Batteries, wiring and connectors

f. Remote command and control

g. Ground control station

UAS Operating Parameters

The petitioner states that all flights will be operated within visual line of sight (VLOS) of pilot, in daytime VFR flight conditions and all operations will be conducted with the assistance of a second spotter/observer. The UAS flights will be limited to a maximum altitude of 400 feet AGL. Altitude is accurately measured by GPS. The petitioner further states that an operator will ensure that only consenting production personnel will be allowed within 100 feet of the UA operation, and UAS will be kept at least 100' from any inhabited structure. Generally the petitioner's UAS will be operated in rural or suburban areas that will permit significantly larger safety zones.

Flight Standards District Offices (FSDOs) will be notified as required prior to operations to describe intended coordination for proposed operation(s). 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

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 hangliders). 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 Airmen ("NOTAM").

Pilot in Command (PIC)

The pilot in command will be SkyPhilly's CTO Paul Caskey. Mr. Caskey received his airman's private certificate in 1982 and has logged over 750 hours in a multitude of aircraft. He has also taken and passed the FAA IFR airman's written test. In addition to Mr. Caskey's experience as PIC in manned aircraft, he has long had the hobby of R/C fixed wing aircraft and, more recently, rotorcraft. Total flight time of unmanned aircraft is on the order of 30 years. Rotorcraft time is in excess of 63 hours total with 12 hours experience in-type as described above. Mr. Caskey has a current airman's 3rd class medical certificate dated 10/6/14.

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.

Radio Frequencies

Radio frequencies used will be those allotted by the FCC for data transmission and vehicle control in unlicensed frequency bands. All devices used will comply with FCC usage and emissions regulations.

Safety and Benefits of the UAS

The petitioner will be using the UAS in a variety of applications that generally require expensive full-size manned aircraft to complete. Small, light, unmanned aerial vehicles offer myriad benefits over the use of full-sized manned aircraft for electric power line inspection, oil/gas pipeline inspection, advanced agriculture, film and still photography, just to name a few. Replacing significantly larger manned aircraft carrying crew and flammable fuel with small UAS carrying no passengers or crew creates a much greater margin of safety for the pilots and crew.

By granting Petitioner's requested exemptions, the FAA will help drive development of safe and successful commercial UAS operations and will advance the public knowledge base for such operations. Petitioner is committed to promoting the UAS research efforts of policymakers including the FAA, NASA, DOD and DARPA by sharing data from its commercial UAS operations and serving as a resource for future UAS research operations. Thus, the FAA has good cause to grant this Petition.

Conclusion

For the foregoing reasons, the exemptions requested herein should be granted and Petitioner should be permitted to conduct small UAS operations in accordance with its manuals and all other operating parameters deemed necessary and appropriate by the FAA.