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

RE: Exemption Request Section 333 of the FAA Reform Act of 2012

Attachments: 1) Phantom 2 Vision+ User Manual V1.6 2014-11-12
2) Phantom 2 Vision Plus (Quick Start Guide) 2014-11-18
3) Phantom pilot training guide V1.1 2014-04-07

References: 1) FAA Exemption No. 11138, Regulatory Docket No. FAA-2014-0481 in the matter of the petition of DOUGLAS TRUDEAU
2) FAA Exemption No. 11136, Regulatory Docket No. FAA-2014-0508 in the matter of the petition of ADVANCED AVIATION SOLUTIONS LLC
3) FAA Exemption No. 11080 Regulatory Docket No. FAA-2014-0355 in the matter of the petition of FLYING CAM INC

Dear Sir or Madam,

In accordance with the FAA's *Guidelines for Submitting a Petition for Exemption under section 333 of the FAA Modernization and Reform Act of 2012*, I Bryan Cherry, referred to hereafter as the petitioner, request exemption from the following sections of Title 14, Code of Federal Regulations §§

61.113(a); 61.113(b); 91.119(c); 91.121; 91.151(a); 91.405(a); 91.407(a)(1); 91.409(a)(1); 91.409(a)(2); 91.417(a) & (b);

In order to operate small unmanned aircraft systems (UAS) commercially in airspace regulated by the Federal Aviation Administration (FAA) for the purposes of aerial photography, cinematography, videography, mapping, crop surveying, inspections and other flight operations that could be performed safely and more cost effectively with the

use of small UAS at low altitude within the U.S. national airspace system as compared to a manned aircraft. Operations will be performed only at the request of and with the authorization and permission of clients or their authorized agents in order to facilitate commerce and raise awareness of the beneficial uses of small unmanned air systems. So long as such operations are conducted within and under the conditions outlined herein or as may be established by the FAA as required by Section 333. The conditions identified and proposed by the petitioner are drawn from references 1-3.

The FARs

The petitioner seeks exemption from the above mentioned FARs for the following reasons;

61.113(a) & (b); The petitioner requests relief in order to facilitate the utilization of pilots, who hold a PRIVATE PILOT (or greater) certificate. Any pilots operating under this exemption would be required to comply with any conditions as set forth and in a similar fashion to the previously granted exemptions.

91.119(c) As discussed in Exemption 11138 (DOUGLAS TRUDEAU), operations conducted closer than 500 feet to the ground may require that the UA be operated closer than 500 feet to essential persons, or objects that would not be possible without additional relief. The petitioner requests modification, waiver or exemption and clarification concerning the terms “congested areas” and “densely populated”. The petitioner requests waiver for this condition to allow reasonable and responsible operations in areas of subdivisions and neighborhoods if required.

91.121 As discussed in Exemption 11138 (DOUGLAS TRUDEAU) is inapplicable since the UAS does not have an altimeter and instead utilizes electronic GPS with a barometric sensor for altitude information.

91.151(a) As discussed in Exemption 11136 (ADVANCED AVIATION SOLUTIONS LLC) prior relief has been granted for manned aircraft to operate at less than the prescribed minimums, including Exemption Nos. 2689, 5745, and 10650. In addition, similar UAS-specific relief has been granted in Exemption Nos. 8811, 10808, and 10673 for daytime, VFR conditions. The UAS provides battery power remaining in percent to the PIC. The UA batteries provide approximately 25 minutes of powered flight. Information provided in the operating documents discusses procedures regarding remaining battery power management. Those documents contain a condition in which the PIC will initiate a landing procedure when battery remaining reaches a specified

level. Given the limitations on proposed operations and the location of those proposed operations, The FAA found that a reduced minimum power reserve for flight in daytime VFR conditions was reasonable.

91.405(a); 91.407(a)(1); 91.409 (a)(1) & (2); 91.417(a) & (b) As discussed in Exemption 11138 (DOUGLAS TRUDEAU), The petitioner proposes to inspect and ensure that the UAS is in a condition for safe flight in accordance with the operating documents. The FAA found that adherence to the petitioner's operating documents and the conditions and limitations specified, describing the requirements for maintenance, inspection, and recordkeeping, were sufficient to ensure that safety would not be adversely affected.

The UAS

The DJI Phantom 2 vision plus is a highly successful consumer grade small rotorcraft in the quadcopter configuration with an advertised weight of less than 44 Ounces (1242g) designed primarily to carry aloft a high definition camera. It has an advertised maximum speed of less than 30 knots (15m/s) and a maximum climb rate of less than 1200 feet per minute (6 m/s). It is powered by four electric motors with a distance between motors of less than 14 inches (350mm) It utilizes an internal inertial measuring unit (IMU) with integrated barometric sensor augmented with global positioning system (GPS) to maintain its geospatial orientation and position. It is controlled primarily through an FCC certified radio control (RC) unit. Real time video and telemetry information is transmitted back to a ground control station allowing the operator and/or PIC to monitor battery level, GPS signal strength, altitude (AGL), distance from PIC, camera imagery, and control camera angle. It has failsafe modes of operation for either loss of RC or GPS signal. Altitude can be limited by the onboard flight controller and maximum altitude can be preprogrammed by the PIC. Battery life limits flight times to approximately 25 minutes. The onboard flight controller will warn the pilot via telemetry and external lighting cues before reaching a low battery state. An automatic termination of flight and landing will be initiated when the battery reaches a predetermined low state. It is anticipated that flights will usually last less than 10 minutes. More information is available in attachment 1 or <http://www.dji.com/product/phantom-2-vision-plus>

Risk mitigation

The petitioner has reviewed FAA exemptions reference's 1-3 *Conditions and Limitations* section and believes that the procedures specified therein are reasonable

and will be utilized in order to manage and mitigate risk and ensure public safety. A preflight checklist will be developed and employed to ensure that the UA airworthiness will be verified before launch. Airworthiness will be maintained by performance of routine inspections before each flight, maintaining flight and maintenance logs to record time on failure-prone components.

The petitioner request that in a manner similar to reference 3, he be allowed to operate within 5 miles of an airport provided that;

“The UA may not operate in Class B, C, or D airspace without written approval from the FAA. The UA may not operate within 5 nautical miles of the geographic center of a nontowered airport as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airport’s management is obtained, and the operation is conducted in accordance with a NOTAM as required by the operator’s COA. The letter of agreement with the airport management must be made available to the Administrator upon request.”

Operations within 5 miles of an airport are not anticipated to be routine but the petitioner is requesting a mechanism to facilitate such activities without requesting a new and separate exemption(s) should the need arise. Operations within class B airspace are not requested due to the lack of mode C transponder.

Public interest

Use of the UAS in lieu of a manned aircraft would enhance safety and reduce the environmental impact as compared to similar operations conducted with manned aircraft of greater proportions, carrying a crew and flammable fuel. Additionally, use of the UAS in order to facilitate commerce could lead to economic growth. Operations for this petition will enable service for property owners or their designees seeking an enhanced perspective for characteristics, amenities, and benefits of their desired photographic subjects that cannot be displayed through ground level videography/photography. Aerial photography is a valuable marketing tool that can lead to increased commerce and enhance personal photography. Crop surveying applications could lead to decreased use of pesticides and fertilizer and conservation of water as well as increased crop yields and decreased costs. Aerial surveying and inspections can increase work site efficiency, improve volumetric estimations and reduce risks. The petitioner will provide clients with photographic data for these purposes on a ‘for hire’ basis acting as an independent contractor. A visual observer will be utilized. Liability insurance will be

obtained commensurate with the granting of this request for exemption. Flight data including UA flight time, Control Unit operation time, incident, accident, and details concerning any deviations from normal operations will be available to FAA for use in collecting data regarding the use of UAS as part of this application. This data may be submitted to FAA via traditional means, e.g. COA Monthly Reports, or other means as required.

Conclusion

The petitioner is requesting this exemption for the purposes of “aerial photography, cinematography, videography, mapping, crop surveying, inspections and other flight operations”. The reason for such a general and broad based request is that the petitioner wishes to utilize a business strategy of horizontal integration and maximize economies of scope in order to capitalize on opportunities as they may arise in the future without the long turnaround time associated with additional exemptions. The petitioner's business model is based on the idea of offering ad hoc small UAS services to individuals or companies who wish to employ these services as a safe, effective, and legal option to enhance their business or hobby. The petitioner's own market research shows pent up demand for these services currently exists in the real estate market and other markets are just beginning to emerge. Although videography and photography are included in the request, the primary objective will be aerial survey of farm crops for precision agriculture. The petitioner has identified universities and other agencies that could benefit from the operation requested in this application.

A quick internet search will show that many are currently operating similar UAS in exactly this fashion without, it is assumed, FAA authorization. The petitioner has refrained from engaging in commercial use of the UAS. The primary purpose of seeking this exemption is to obtain the capability to offer those services while remaining in compliance. The petitioner has 28 years of experience in the radio control model aircraft hobby, 24 years experience in general, military, and commercial aviation and holds an airman certificate, AIRLINE TRANSPORT PILOT, as well as a current second class medical certificate. .

Respectfully submitted,

Bryan Cherry