

January 22, 2015

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 the Federal Aviation Regulations

Dear Sir or Madam,

I, Elisabeth Bisschops, owner of Elevated Images, am writing pursuant to the FAA Modernization and Reform Act of 2012 and the procedures contained within 14 C.F.R. 11, to request that Elevated Images, a photography business specializing in Community Outreach and Real Estate, be exempted from the Federal Aviation Regulations ("FARs") listed below so that we may operate a small ultra-lightweight unmanned aircraft system ("sUAS") commercially in airspace regulated by the Federal Aviation Administration ("FAA").

As described herein I, Elisabeth Bisschops, am chief photographer / videographer at Elevated Images, which has acquired a DJI Phantom 2 Vision+ "V1.0" Quadcopter with FPV HD Video Camera with intent to operate it for commercial aerial photography / videography following exemption and approval by the FAA. Johannes Bisschops is an FAA licensed Commercial Pilot, as well as an active Certified Flight Instructor (certificate # 3366338CFI), also experienced in flying hobby aircraft for recreational purposes. Johannes will be chief pilot at Elevated Images for the proposed use of the sUAS.

Exemption request would permit operation of ultra-light weight, unmanned (piloted by remote control) and comparatively inexpensive sUAS(s) in tightly controlled and limited airspace photographing or videographing within property boundaries for individual property owners with their permission as well as the professional realtor's permission.

I, Elisabeth Bisschops, owner of Elevated Images, will detail in this petition the specific regulations for which we seek relief, offering alternate and equivalent ways of providing a level of safety at least equal to the existing rules. This petition focuses on public safety and public benefit.

Appendix A – Elevated Images Operating Procedures

Attachment B - Phantom 2 Vision Plus (User Manual 1.6)

I. Contact Information:

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II. The Specific Sections of Title 14 of the Code of Federal Regulations From Which Elevated Images Requests Exemption are:

14 C.F.R. Part 21 subpart H; 14 C.F.R. 45.23(b); 14 C.F.R. 61.113(a)&(b); 14 C.F.R. 91.7(a); 91.9(b) (2); 91.103(b); 91.109; 119.121; 91.151(a); 91.203(a)&(b); 91.405(a); 91.407(a) (1); 91.409(a) (2); 91.417(a)&(b)

III. The Extent of relief Elevated Images seeks and the Reason She Seeks Such Relief:

I, Elisabeth Bisschops, submit this application in accordance with the Reform Act, 112 P.L. 95 §§ 331-334, seeking relief from any currently applicable FARs operating to prevent Elevated Images' contemplated commercial use of an sUAS for photographic and videographic use within the national airspace system. The Reform Act in Section 332 provides for such integration of civil unmanned aircraft systems into our national airspace system as it is in the public's interest to do so. Elevated Images' ultra-lightweight sUAS meets the definition of "small unmanned aircraft" as defined in Section 331 and therefore the integration of my ultra-lightweight sUAS is expressly contemplated by the Reform Act. I would like to operate my ultra lightweight sUAS prior to the time period by which the Reform Act requires the FAA to promulgate rules governing such craft. Thereby, providing direct experience and valuable information for formal regulation that can be administered uniformly to all related sUAS aerial photography & videography. The Reform Act guides the Secretary in determining the types of sUASs that may operate safely in our national airspace system. Considerations include: The weight, size, speed and overall capabilities of the sUASs; whether the sUAS will be operated near airports or heavily populated areas; and, whether the sUAS will be operated by line of sight. 112 P.L. 95 § 333 (a). Each of these items reflect in favor of an exemption for Elevated Images. My sUAS utilizes four (4) counter-rotating propellers for balance, control and stability. My sUAS is equipped with GPS and auto return safety technology. Weighing less than five (5) pounds (far below the maximum 55 pound limit); including camera with gimbal. I, Elisabeth Bisschops, consider safety the utmost importance with every flight. My small unmanned aircraft is designed to hover in place via GPS and operate in less than a 16 knot (17 mph) wind. For safety, stability and fear of financial loss I will not fly in winds exceeding 12 knot (13 mph). Built in safety systems include a GPS mode that allows my sUAS to hover in place when radio controls are released. When pilot communication is lost, the sUAS is designed to slowly descend to the point of take-off. Elevated Images will not operate sUAS near airports, Hospitals nor Police heliports, and will not operate near areas where general public is within thirty to one hundred (30-100) yards depending on location, conditions and weather. We utilize a crew of two (2), a pilot ("PIC"), and a

spotter who are constantly on alert for any manned aircraft (Police/Medical helicopters, etc.) and prepared to land / abort immediately to the nearest and safest ground point should a manned aircraft approach the area of operation. Our sUAS is capable of vertical and horizontal operations, and is flown only within line of sight of the PIC. Utilizing battery power rather than combustible fuels, flights generally last between ten (10) to fifteen (15) minutes, with an altitude under two hundred (200) feet. Elevated Images will utilize a fresh fully charged battery with each flight as a safety precaution; full flight time limit for each battery is twenty (20) to twenty-five (25) minutes as tested. Elevated Images will not operate sUAS at or below the manufacturer recommend minimum charge levels for operation; preferring to remain well within a safe operating range to insure adequate communication between radio control and sUAS to eliminate potential for crash, loss of control or hazards. Reserve batteries are at hand with each mission to insure replacement for sufficient safe level of operation. We do not believe in taking risks that may cause a crash, which could create hazards to the public / property / manned aircraft, and we have no desire to lose our investment. The crew will always include an FAA licensed and current pilot. The crew at Elevated Images have done scores of practice flights in remote areas on private property as hobbyists simulating flights for future commercial use to gain familiarization with the characteristics of this specific sUAS's performance under different temperature and weather conditions.

Elevated Images chief pilot will be Johannes Bisschops, an FAA licensed Commercial Pilot and active CFII. He is extremely cautious when operating our sUAS / ultra-lightweight unmanned aircraft and will not "create a hazard to users of the national airspace system or the public." 112 P.L. 95 § 333 (b). Given the small size and weight of my sUAS it falls well within Congress's contemplated safety zone when it promulgated the Reform Act and the corresponding directive to integrate sUASs into the national airspace system. My Phantom 2 sUAS, used in hobby flight, has a demonstrated safety record and does not pose any threat to the general public.

IV. How Elevated Images Request Will Benefit the Public As A Whole:

Elevated Images is a small business serving realtors and news outlets in South-East Pennsylvania and Central New Jersey. Aerial photography has been around for a long time through manned fixed wing aircraft and helicopters and we have been using those at Elevated Images for the last ten+ years. In 2014, Elevated Images conducted well over 50 aerial photography missions using manned powered aircraft, most lasting over one hour each, and conducted at minimum safe altitudes at or above 500 to 1000 feet AGL. Some of these missions can be replaced with more cost effective, safer, and more environmentally friendly sUAS missions. In addition, for many small budget productions the expense of such aerial photography and videography using manned aircraft is cost prohibitive. We operate in a very competitive environment, competing with large nationwide photography and videography suppliers. We are able to compete on quality and service. The advent of sUAS's used in this business environment, and their ability to produce unique images will not only help our small business compete with larger businesses, but also provide our realtor customers with their own new business value, thus promoting commerce and economic development. Permitting Elevated Images to immediately fly within national air space furthers economic growth in our South-East Pennsylvania and Central New Jersey area, and provides a definite benefit to the Realtors and news outlets looking to use aerial photography and videography, both of which increase commerce and serve as a benefit and stimulus to the area economy and community.

V. Reasons Why Elevated Images' Exemption Will Not Adversely Affect Safety or How The Exemption Will Provide a Level of Safety At Least Equal To Existing Rule:

Elevated Images has the utmost respect for everyone's safety and comfort. Our chief pilot, Johannes Bisschops, as a current Commercial Pilot and active Flight Instructor, has a solid understanding of the National Airspace System, and a reputation and track record of conservative decisions concerning safety. As it concerns to sUAS operations:

Our sUAS (DJI Phantom 2 Vision+ "V1.0" Quadcopter with FPV HD Video Camera) weighs less than 5 pounds;

- Each mission will consist of a crew of 2: one PIC and one spotter;
- At least one of the crew is an FAA licensed commercial pilot with a current medical certificate and flight review;
- The PIC will have a minimum of 50 logged flights and 20 total hours in the make and model of the operating sUAS, including at least 3 flights in the last 90 days;
- We only operate our sUAS below 200 feet in day VFR conditions (well within the 400 foot permissible ceiling set by the FAA Modernization and Reform Act of 2012);
- We will not operate the sUAS in Class A, B, C, or D airspace without written approval from the FAA;
- We will not operate within 3 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 will be made available to the Administrator upon request;
- During operation of the sUAS, signs will be posted warning the public that: "Caution: Small Unmanned Aircraft Operation in Progress";
- If any unauthorized person moves within 200 feet of the operating sUAS, the mission will be aborted immediately;
- Our sUAS only operates for five (5) to ten (10) minutes per flight, severely limiting the exposure of any safety concerns towards the public or property;
- We pilot our sUAS through remote control only by visual line of sight, keeping the sUAS within 500 feet of the operator at all times;
- Our sUAS has GPS controlled failsafe, a flight safety feature whereby it hovers and then slowly lands if communication with the remote control pilot is lost;
- We actively record and analyze flight data and other sources of information to constantly update and enhance safety protocols;
- Before each flight we assess the environment and we only proceed to operate in reasonably safe environments that are controlled, are away from power lines, elevated lights, airports and actively populated areas;
- We conduct extensive pre-flight inspections and protocol, during which safety carries primary importance;
- We always obtain all necessary permissions prior to operation; and we have procedures in place to abort flights in the event of safety breaches or potential danger.

VI. A Summary: The FAA May Publish in the Federal Register:

- A. 14 C.F.R. 21 and 14 C.F.R. 91: Airworthiness Certificates, Manuals and the Like.

14 C.F.R. 21, Subpart H, entitled Airworthiness Certificates, sets forth requirements for procurement of necessary airworthiness certificates in relation to FAR § 91.203(a)(1). The size,

weight and enclosed operational area Elevated Images' sUAS permits exemption from Part 21 because our sUAS meets (and exceeds) an equivalent level of safety pursuant to Section 333 of the Reform Act. The FAA is authorized to exempt aircraft from the airworthiness certificate requirement under both the Act (49 U.S.C. § 44701 (f)) and Section 333 of the Reform Act. Both pieces of legislation permit the FAA to exempt sUASs from the airworthiness certificate requirement in consideration of the weight, size, speed, maneuverability and proximity to areas such as airports and dense populations. Elevated Images' sUAS meets or exceeds each of the elements.

14 C.F.R. 91.7(a) prohibits the operation of an aircraft without an airworthiness certificate. As no such certificate will be applicable in the form contemplated by the FARs, this Regulation is inapplicable.

14 C.F.R. § 91.9 (b) (2) requires an aircraft flight manual in the aircraft. As there are no on board pilots or passengers, and given the size of the sUASs, this Regulation is inapplicable. An equivalent level of safety will be achieved by maintaining a safety/flight manual delineating areas of where safety can be defined. The FAA has previously issued exemptions to this regulation in Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10167A, 10602, 10700 and 32827.

14 C.F.R. § 91.121 regarding altimeter settings is inapplicable insofar as our sUAS utilizes electronic global positioning systems with a barometric sensor, and altitude information will be provided to the pilot via a digitally encoded telemetric datalink to a realtime display.

14 C.F.R. § 91.203 (a) and (b) provides for the carrying of civil aircraft certifications and registrations. They are inapplicable for the same reasons described above. The equivalent level of safety will be achieved by maintaining any such required certifications and registrations by Elevated Images.

- B. 14 C.F.R. § 45.23: Marking of the Aircraft. Applicable Codes of Federal Regulation require aircraft to be marked according to certain specifications. My sUASs are, by definition, unmanned. They therefore do not have a cabin, cockpit or pilot station on which to mark certain words or phrases. Further, two-inch lettering is difficult to place on such small aircraft with dimensions smaller than minimal lettering requirement. Elevated Images will mark the sUAS in the largest possible lettering by placing the word "EXPERIMENTAL" on its fuselage as required by 14 C.F.R. §45.29 (f) so that the PIC, or anyone assisting the PIC as a spotter will see the markings. The FAA has previously issued exemptions to this regulation through Exemptions Nos. 8738, 10167, 10167A and 10700.
- C. 14 C.F.R. § 61.113: Private Pilot Privileges and Limitations: PIC. Pursuant to 14 C.F.R. §§ 61.113 (a) & (b), private pilots are limited to non-commercial operations. Elevated Images can achieve an equivalent level of safety as achieved by current Regulations. The PIC will have a Commercial Pilot certificate with a current Medical, and will meet the flight review requirements specified in 14 CFR § 61.56.
- D. 14 C.F.R. § 91.119 prescribes safe altitudes for the operation of civil aircraft. It allows helicopters to be operated at lower altitudes in certain conditions. Our sUAS will never operate at an altitude greater than 200 feet AGL, only in safe areas away from the public and traffic. Given the small size and weight of the sUAS, its maneuverability and speed profile, we can achieve an equivalent level of safety.

- E. 14 CFR § 91.151(a) requires a thirty (30) minute fuel reserve for flight in VFR conditions. Since maximum flight time is limited to battery capacity, and is less than 30 minutes for our sUAS, we will operate our sUAS for no longer than ten (10) to fifteen (15) minutes on a full charge. A full charge would allow for a flight time of at least twenty (20) minutes, providing a 25% to 50% safety margin. The FAA has previously issued exemptions for manned aircraft to operate at less than the minimums prescribed in 14 CFR § 91.151(a), 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, Visual Flight Rules (VFR) conditions.
- F. 14 C.F.R. 91.405 (a); 407 (a) (1); 409 (a) (2); 417(a) & (b): Maintenance Inspections. The above-cited Regulations require, amongst other things, aircraft owners and operators to “have [the] aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in part 43 of this chapter. . . .”
- To comply with this regulation, the PIC, before each mission, will check the manufacturers’ internet service pages, and ensure applicable software and hardware is up to date as required, and ensure compliance with any safety bulletins posted. In addition, the Operators Manual as provided by the sUAS manufacturer will be revised to include specific operating procedures and limitations to comply with the exemptions sought as described in section V (see appendix A). The revised Operators Manual will be in possession of the crew during operation of the sUAS, and must be made available to the Administrator or any law enforcement official upon request.

In summary, Elevated Images seeks an exemption from the following Regulations:

14 C.F.R. 21, subpart H; 14 C.F.R. 45.23(b); 14 C.F.R. § 61.113 (a) & (b); 14 C.F.R. §91.7 (a); 14 C.F.R. §91.9 (b)(2); 14 C.F.R. § 91.103(b); 14 C.F.R. § 91.109; 14 C.F.R. §91.119; 14 C.F.R. § 91.121; 14 C.F.R. §91.151(a); 14 C.F.R. § 91.203(a) and (b); 14 C.F.R. § 91.405 (a);14 C.F.R. § 91.407 (a)(1); 14 C.F.R. §91.409 (a)(2); and, 14 C.F.R. § 91.417(a) & (b) to commercially operate Elevated Images’ small unmanned vehicle/lightweight unmanned aircraft vehicle in community awareness and aerial photography and videography operations. Elevated Images will utilize safety protocols and the implementation of a flight operations manual that exceeds currently accepted means and methods for safe flight. Elevated Images will conduct formal collection of information of its operation of the sUAS, which will be shared with the FAA, and will contribute to the enhancement of the FAA's internal efforts to establish protocols for complying with the FAA Modernization and Reform Act of 2012. Elevated Images’ operation of the sUAS, weighing less than 5 pounds and travelling at low speeds within limited controlled areas will provide an equivalent level of safety as that achieved under current FARs. Accordingly Elevated Images respectfully requests that the FAA grant our exemption request.

Respectfully submitted,

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Appendix A – Elevated Images Operating Procedures

Safety is our main concern. Owner and crew must be familiar with, and follow these operating procedures:

- 1) Owner must:
 - a. Document all maintenance, alterations, and updates in the aircraft records.
 - b. Any maintenance or alterations that affect the sUAS operation or flight characteristics, e.g. replacement of a flight critical component, must undergo a functional test flight in accordance with the operator's manual. The PIC who conducts the functional test flight must make an entry in the UAS aircraft records of the flight.
- 2) Prior to each mission:

The PIC must familiarize him/herself with all possible safety aspects of the mission. This includes but is not limited to:

 - i. Software versions required (manufacturers web site)
 - ii. Weather
 - iii. Wind (less than 12 knots)
 - iv. NOTAMS
 - v. Proximity of airports or SUA

- 3) Prior to each flight:

the PIC must inspect the sUAS and Ground Station to ensure they are in a condition for safe flight. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight. This includes but is not limited to:

 - i. Batteries (full sUAS battery required for each flight, check battery levels for transmitter and range extender)
 - ii. Inspect propellers, motors, wings and lights
 - iii. The documents required under 14 CFR §91.9 and §91.203 must be available to the PIC at the Ground Control Station of the sUAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

The PIC performs a safety assessment. This includes but is not limited to:

- iv. If operating within 3 miles of an uncontrolled airport, check that a letter of agreement that covers the current mission with the airport manager is available to the PIC, and that the operation is conducted under a current NOTAM.
- v. Inspect flight area for light poles, trees, utility wires, proximity to helipads, hospitals, schools, busy roadways, gatherings of people, SUA.
- vi. The PIC provides a safety briefing to the spotter. An agreement is made under which conditions the flight must be aborted.
- vii. Check placement of warning signs: "Caution: Small Unmanned Aircraft Operation in Progress"
- viii. Identify take off and landing area.

The PIC performs pre-flight checks:

- i. Check all controls neutral

- ii. Turn on Power transmitter first, then on sUAS, and Range Extender
- iii. Perform GPS alignment according to manufacturers operating manual
- iv. If alignment successful, flight can start from a safe take-off point
- v. Immediately after takeoff perform the following checks:
 - a. Hover 5-10 feet
 - b. Check data link
 - c. Check video link
 - d. Check altimeter
 - e. Check GPS
 - f. Check time

4) During each flight:

- a. The sUAS may not be operated by the PIC from any moving device or vehicle.
- b. The sUAS may not be operated at an altitude exceeding 200 feet AGL.
- c. The sUAS may not be operated at night or at altitudes less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles.
- d. The sUAS must remain clear and yield the right of way to all other manned operations and activities at all times (including, but not limited to, ultralight vehicles, parachute activities, parasailing activities, hang gliders, etc.).
- e. Flight time is limited to maximum fifteen (15) minutes.
- f. sUAS must remain within line of sight and within 500 feet of PIC.

5) Emergency during flight. This could include but is not limited to:

- i. Pilot distracted
- ii. Spotter signals abort
- iii. Sudden change in weather or wind
- iv. Manned aircraft in the vicinity
- v. People getting within safety perimeter
- vi. Birds

Immediately:

- b. Determine closest safe landing location to sUAS
- c. Land

6) After each flight:

- a. Check and log flight time and remaining battery level.
- b. Turn off power to sUAS first, then turn off power to transmitter and range extender
- c. Inspect sUAS for any damage
- d. Remove warning signs

Attachment B - Phantom 2 Vision Plus (User Manual 1.6)



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