U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

September 2, 2015

Exemption No. 12712
Regulatory Docket No. FAA–2015–1753

Mr. William J. Preston
417 Drone Imaging, LLC
2912 West Garton Road
Ozark, MO 65721

Dear Mr. Preston:

This letter is to inform you that we have granted your request for exemption. It transmits our decision, explains its basis, and gives you the conditions and limitations of the exemption, including the date it ends.

By letter dated June 10, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of 417 Drone Imaging, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial surveying, photography, videography, inspections, training[1], and closed-set video production.

See Appendix A for the petition submitted to the FAA describing the proposed operations and the regulations that the petitioner seeks an exemption.

The FAA has determined that good cause exists for not publishing a summary of the petition in the Federal Register because the requested exemption would not set a precedent, and any delay in acting on this petition would be detrimental to the petitioner.

[1] The petitioner requested authority to conduct UAS training. At this time, the FAA is unable to authorize UAS operations for training until a further assessment is completed. When the FAA completes its review, we will proceed accordingly and no further action will be required by the petitioner. However, the petitioner is permitted to train its own pilot in commands and visual observers in accordance with condition no. 14 and the other conditions and limitations in this exemption.

Airworthiness Certification

The UAS proposed by the petitioner are the DJI Inspire 1, DJI S900, DJI Phantom 2, DJI Phantom 3, and 3D Robotics Solo.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

You have requested to use a UAS for aerial data collection[2]and closed set motion picture and filming. The FAA has issued grants of exemption in circumstances similar in all material respects to those presented in your petition. In Grants of Exemption Nos. 11062 to Astraeus Aerial (*see* Docket No. FAA−2014−0352), 11109 to Clayco, Inc. (*see* Docket No. FAA−2014−0507), 11112 to VDOS Global, LLC (*see* Docket No. FAA−2014−0382), and 11213 to Aeryon Labs, Inc. (*see* Docket No. FAA−2014−0642), the FAA found that the enhanced safety achieved using an unmanned aircraft (UA) with the specifications described by the petitioner and carrying no passengers or crew, rather than a manned aircraft of significantly greater proportions, carrying crew in addition to flammable fuel, gives the FAA good cause to find that the UAS operation enabled by this exemption is in the public interest.

Having reviewed your reasons for requesting an exemption, I find that—

- They are similar in all material respects to relief previously requested in Grant of Exemption Nos. 11062, 11109, 11112, and 11213;
- The reasons stated by the FAA for granting Exemption Nos. 11062, 11109, 11112, and 11213 also apply to the situation you present; and
- A grant of exemption is in the public interest.

[2] Aerial data collection includes any remote sensing and measuring by an instrument(s) aboard the UA. Examples include imagery (photography, video, infrared, etc.), electronic measurement (precision surveying, RF analysis, etc.), chemical measurement (particulate measurement, etc.), or any other gathering of data by instruments aboard the UA.

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, 417 Drone Imaging, LLC is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection and closed set motion picture and filming. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption, 417 Draft Imaging, LLC is hereafter referred to as the operator.

Failure to comply with any of the conditions and limitations of this grant of exemption will be grounds for the immediate suspension or rescission of this exemption.

1. Operations authorized by this grant of exemption are limited to the DJI Inspire 1, DJI S900, DJI Phantom 2, DJI Phantom 3, and 3D Robotics Solo when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

2. Operations for the purpose of closed-set motion picture and television filming are permitted.

3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.

4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude must be reported in feet AGL.

5. The UA must be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate or U.S. driver's license.

6. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. The VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times;

electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents, the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS−80) may be contacted if questions arise regarding updates or revisions to the operating documents.

8. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g., replacement of a flight critical component, must undergo a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.

9. The operator is responsible for maintaining and inspecting the UAS to ensure that it is in a condition for safe operation.

10. Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, e.g., inoperable components, items, or equipment. 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.

11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.

12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.

13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.

16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.

17. The UA may not be operated 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.

18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.

19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.

20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.

21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The exemption holder may apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N−Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.

23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

24. The UA must remain clear and give way to all manned aviation operations and activities at all times.

25. The UAS may not be operated by the PIC from any moving device or vehicle.

26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
    a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and
    b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

    The PIC, VO, operator trainees or essential persons are not considered nonparticipating persons under this exemption.

27. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative.

Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.

28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS−80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

If this exemption permits operations for the purpose of closed-set motion picture and television filming and production, the following additional conditions and limitations apply.

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.

30. At least 3 days before aerial filming, the operator of the UAS affected by this exemption must submit a written Plan of Activities to the local Flight Standards District Office (FSDO) with jurisdiction over the area of proposed filming. The 3-day notification may be waived with the concurrence of the FSDO. The plan of activities must include at least the following:
    a. Dates and times for all flights;
    b. Name and phone number of the operator for the UAS aerial filming conducted under this grant of exemption;
    c. Name and phone number of the person responsible for the on-scene operation of the UAS;
    d. Make, model, and serial or N−Number of UAS to be used;
    e. Name and certificate number of UAS PICs involved in the aerial filming;
    f. A statement that the operator has obtained permission from property owners and/or local officials to conduct the filming production event; the list of those who gave permission must be made available to the inspector upon request;
    g. Signature of exemption holder or representative; and
    h. A description of the flight activity, including maps or diagrams of any area, city, town, county, and/or state over which filming will be conducted and the altitudes essential to accomplish the operation.

31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

Unless otherwise specified in this grant of exemption, the UAS, the UAS PIC, and the UAS operations must comply with all applicable parts of 14 CFR including, but not limited to, parts 45, 47, 61, and 91.

This exemption terminates on September 30, 2017, unless sooner superseded or rescinded.

Sincerely,
/s/
John S. Duncan
Director, Flight Standards Service

Enclosures

417 Drone Imaging LLC
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Date: June 10, 2015

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

RE: Amended Petition of 417 Drone Imaging, LLC for Exemption Pursuant to Section 333 of the FAA Reform Act

Attn: To whom it may concern

After researching further I would like to submit an amended petition. I found one issue that may cause delay or possible refusal of approval for my exemption. I have removed those references in this amended petition. I also need to amend the list of aircraft and add one description of proposed operations. The changes are as follows:

1) Opening paragraph: added News gathering as a proposed operation
2) List of requested operations: Removed mention of night operations.
3) List of requested operations: Added News Gathering
4) List of requested relief from rules: Removed reference to 91.205 (c)
5) List of requested relief from rules: Removed mention of 91.209
6) List of approved aircraft: Added DJI Phantom 3
7) List of approved aircraft: Added 3DR Solo
8) Detailed list of rules and alternate method of compliance: Removed 91.205 (c)
9) Detailed list of rules and alternate method of compliance: Removed 91.209

I ask that you process this amended request in place of the original as it fits with previous petitions for exemption.

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11, 417 Drone Imaging, LLC, operator of Small Unmanned Aircraft Systems ("sUASs") equipped to conduct aerial photography and videography, News gathering, Aerial Surveying, Closed set Video production, training, hereby applies for an exemption from the listed Federal Aviation Regulations ("FARs") to allow commercial operation of its sUASs, 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 333.1

As described more fully below, the requested exemption would permit the operation of small, unmanned and relatively inexpensive sUAS under controlled conditions in airspace that is 1) limited 2) predetermined and 3) controlled. The proposed exemption, if granted, would allow 417 Drone Imaging, LLC 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. Page 2. 417 Drone Imaging LLC asks that if any part of this request is deemed not in compliance, that part be removed and process the remaining of this request as applicable.

417 Drone Imaging, LLC is a media/technology company owned and run by William Preston. Mr. Preston has a Commercial Instrument Rotorcraft Certificate. He has extensive experience low level rotorcraft aviation and the unique risks and problems associated. He has nearly 8 years flying part 135 operations and 5 years as Chief Pilot of part 135 operations. His total time is nearly 4,500 hrs. Also, Mr. Preston has been active in Radio Controlled Aircraft for over 30 years with experience in fixed wing and rotary wing aircraft.

417 Drone Imaging, LLC plans to exploit the capabilities of Unmanned Aerial Systems to offer a multitude of services, including:
- Aerial surveying
- Event Photography/Videography
- Agriculture purposes
- Real Estate Photography
- Aerial filmmaking and photography
- Construction site inspections and monitoring
- Closed set video production
- News Gathering

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:
Regulations from which the exemption is requested:
14 C.F.R. Part 21
14 C.F.R. 45.23 (b)
14 C.F.R. 61.113(a) and (b)
14 C.F.R. 91.7 (a)
14 C.F.R. 91.9 (b) (2)
14 C.F.R. 91.109
14 C.F.R. 91.119
14 C.F.R. 91.121Page 3
14 C.F.R. 91.151(a)
14 C.F.R. 91.203 (a) & (b)
14 C.F.R. 91.205 (b)
14 C.F.R. 91.215
14 C.F.R. (91.401 - 91.417)

Unmanned Aircraft System sUASs are oftentimes seen as superior to helicopters due to the smaller devices cheaper equipment and personnel cost, reduced noise and as such, a much smaller environmental impact which promotes public safety.

We are petitioning for exemption to enable 417 Drone Imaging, LLC to operate the DJI Inspire 1, DJI S900, DJI Phantom 2, DJI Phantom 3, 3DR Solo equipped with a two-axis camera gimbal and using a High-Def camera. This sUAS has a built-in capability to limit the height it flies above the ground, to limit the radius of the distance it flies from the operator. They also has the failsafe function of the autopilot system which means when the communication between the Main Controller and the transmitter is disconnected, the outputs of all command sticks from controller will go to the center position. If the GPS signal is good enough, the system will automatically trigger Return to Home and will land safely.

Please refer to the included Instruction Manuals for the performance limitations and flight operations.

Aircraft Gross weights are less than 164 oz. with battery and the 2 Axis Camera Gimbal and Camera

A Pre-flight inspection will be performed by the PIC in accordance with the factory instruction manual. An added step will be the inspection of the propellers. A propeller will be replaced if it has any nicks and cracks with a manufacturers authorized propeller.

The sUAS will be maintained in accordance with the manufacturers instruction manual and only manufacturer's authorized replacement parts will be used.

FCC Information
This transmitters used for controlling the sUAS complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference
received, including interference that may cause undesired operation.
The radio transmitters used for controlling the sUAS is wireless technology which has been tested and found to be compliant with the applicable regulations governing a radio transmitters in the 2.400GHz to 2.4835GHz frequency range.
Antenna Separation Distance
When operating our transmitters, the PIC will maintain a separation distance of at least
5 cm between his body (excluding fingers, hands, wrists, ankles and feet) and the antenna to meet RF
exposure safety requirements as determined by FCC regulations.

Pilot in Command and Observer Qualifications and Duties
The PIC will maintain at least a Sport Pilot Certificate and a current Class III medical certificate or drivers license, plus at least 1 hours flying time and 3 takeoffs and landings within the previous 90 days in the type of UAS utilized in operations.
The PIC will have at least 100 hours total time and at least 30 hours flying Radio Controlled Model Aircraft of which will be 5 hours flying sUAS's.

Training will be conducted at a local Controlled Access flying field. 417 Drone Imaging has the ability to provide "dual controls" utilizing two transmitters with a wireless link between the transmitters. One transmitter is designated the master transmitter and the other transmitter is designated as a slave. The PIC instructor, utilizing the master transmitter, will be at all times be able assume control of the sUAS.

The PIC is responsible for the safe and efficient operation of the aircraft. Specific duties include all preflight preparation, in flight operation, post flight requirements, all procedures including but not limited to:
Safe in flight operations
Risk Mitigation to Persons and property
Airfield Suitability

The Observer must have the visual acuity to observe the sUAV and be able to communicate clearly with the PIC.
The Observers duties are;
warning the PIC of any impending obstacles in the flight path of the sUAS.
warning the PIC of any deviations in the planned flight path of the sUAS.
warning the PIC should any unauthorized personnel appear in the area of the planned flight.
The Observer will have the authority to order the PIC to terminate the flight should he feel the flight cannot be conducted safely.

General Operating Standards

• 417 Drone Imaging, LLC will only operate its sUAS in line of sight of a pilot and/or observer and will operate at sites that are a 'sufficient distance' from populated areas. Such operations will insure that the sUAS will "not create a hazard to users of the national airspace system or the public."

• Before an operation of a sUAV within 5NM of an airport with a control tower, the control tower will be called to gain permission to operate the sUAS. The PIC will give the position, altitude and the times the sUAV will be operated. The sUAS will not be operated at an altitude of over 400 feet AGL. Weather minimums will be 3 miles visibility and a 1000 foot ceiling.

Before an operation of a sUAS within 5NM of a non-tower controlled, airport operators will be notified and the PIC will give the right of way to avoid flying in the proximity of full-scale aircraft. At no time will the sUAV be operated within the final approach course and the takeoff course of any runway. The sUAV will not be operated at an altitude of over 400 feet AGL. Weather minimums will be 3 miles visibility and a 1000 foot ceiling.

• Maximum flight time for each operational flight will be 30 minutes.

• Flights will be terminated at 25% battery power reserve should that occur prior to the 30 minute limit.

• The sUAV will be programmed so that it will be operated at an altitude of no more than 400 feet AGL.

• Minimum crew for each operation will consist of the sUAS Pilot, and Visual Observer.

• The sUAV operated by the petitioner weighs less than 55 pounds, including the payload (i.e. camera, lens, and gimbals).

• The sUAV will operate at speeds of no more than 30 knots, can hover, and can simultaneously move vertically and horizontally.

• Given the small size of the sUAV and the restricted sterile environment within which they will operate, our sUAV operations adhere to the Reform Act's safety requirements.

The UAS, powered by batteries, is smaller, lighter and more maneuverable than larger aircraft running on combustible fuel, it operates at lower altitudes with no people on board and will thereby reduce current risk levels and thereby enhance safety and diminish the likelihood of death or serious bodily injury. With a small payload and maximum flight time of only 20 minutes, this is offers little or no risk to national security.

Low level oblique photos and video from several angles are far more effective than ground based imagery for displaying the characteristics of large, complex properties with several buildings and large trees. The applicants in the past have chartered 2-seat full-sized helicopters for this purpose, which has proven more costly than many potential clients have been able to afford. The benefits of reduced cost and improved quality of presentation from the UA will be valuable to

and benefit many buyers and sellers of real property as well as mitigating risk by not carrying personnel for flight operations.

The applicant is currently employed as an EMS pilot and has a history of 10+ years of fire/EMS/Rescue experience so Additionally, we request that we be allowed to use our system to benefit first responders nearby who might require assistance, including fire fighters, the police, the sheriff, et al., while remaining subject to all limitations cited in this application as we do so.

(a) No flight will be made with a Gross weight exceeding 55 pounds;

(b) All operations must occur in FAA Class G airspace at no more than 400 ft AGL, at an airspeed of no more than 25 knots and no further than 3/4 NM from the PIC;

(c) All operations must utilize a visual observer (VO). The VO and PIC must be able to communicate by voice at all times during a flight operation;

(d) All required permits will be obtained from state and local government prior to operation;

EXEMPTION REQUESTS AND EQUIVALENT LEVEL OF SAFETY

417 Drone Imaging, LLC requests an exemption from the following regulations as well as any additional regulations that may technically apply to the operation of the sUAV System:

14 CFR Part 21, Airworthiness Certificates
This part establishes the procedures for the issuance of an airworthiness certificate. While the FAA continues to work to develop airworthiness standards for Unmanned Aerial Systems, we request an experimental certificate be issued for the Blade DJI Inspire, DJI Phantom 2, Parrot Drone AR 2.0 under either or
both of the following provisions:
21.191 Experimental certificates. Experimental certificates are issued for the following purposes:
(a) ***Research and development***. Testing new aircraft design concepts, new aircraft equipment, new aircraft installations, new aircraft operating techniques, or new uses for aircraft.
(b) ***Showing compliance with regulations***. Conducting flight tests and other operations to show compliance with the airworthiness regulations including flights to show compliance for issuance of type and supplemental type certificates, flights to substantiate major design changes, and flights to show compliance with the function and reliability requirements of the regulations. Since the experimental certificate can be used for commercial purposes such as market surveys, sales demonstrations, and customer crew training, we would expect that an

experimental certificate would permit our commercial purpose as well. The aircraft will not carry persons or property, will not carry fuel, and will only fly under strict operational requirements. Combined with the UA's light weight, being constructed primarily of carbon fiber and plastic, we propose that the UA will be at least as safe, if not safer, than a conventionally certificated aircraft performing the same mission. If an experimental airworthiness certificate is not appropriate for this application, then we request an exemption of 14 CFR Part 21, Subpart H, and the requirement for an airworthiness certificate in general, citing the equivalent level of safety outlined in the previous paragraph.

14 CFR 45.23 Display of marks; general and 45.29 Size of marks.
These regulations provide that each aircraft must display "N" and the aircraft's registration number in letters at least 3 inches high. Additionally, the aircraft must display the word "EXPERIMENTAL" in letters at least 2 inches high near the entrance to the cabin, cockpit, or pilot station. The sUAV does not have an entrance in which the word "EXPERIMENTAL" can be placed, and may not have a registration number assigned to it by the FAA. We propose to achieve an equivalent level of safety by including the word "EXPERIMENTAL" in the placard on the top of the aircraft, as shown above, where the PIC (Pilot In Control), VO (Visual Observer) and others in the vicinity of the aircraft while it is preparing for launch will be able to see the designation. Additionally, we feel that the permanent placard discussed in the previous paragraph will provide the aircraft's registration information at the ground station. Finally, we will display at the ground station a high contrast flag or banner that contains the words "Unmanned Aircraft Ground Station" in letters 3 inches high or greater. Since the aircraft will operate within 3/4 NM of the ground station, the banner should be visible to anyone that observes the aircraft and chooses to investigate its point of origin.

14 CFR 61.113 Private pilot privileges and limitations: Pilot in Command and 61.133 Commercial pilot privileges and limitations.
The regulation provides that no person that holds a Private Pilot certificate may act as pilot in Command of an aircraft for compensation or hire. Subparagraph (b) allows a private pilot to 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. Our proposed operations require that the PIC must hold at least a Sport Pilot Certificate with a Drivers License and since the aircraft cannot carry passengers or property, we feel we meet the intent of 61.113 Subparagraph (b) even though the intent of this application is to conduct a business.

14 CFR 91.7 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 CFR 91.9 Civil aircraft flight manual, marking, and placard requirements.
This regulation provides that no person may operate an aircraft unless a current, approved flight manual is in the aircraft. We assume that the intent of this requirement is to ensure that flight

manual information is available to the aircrew while operating the aircraft. We request an exemption to this requirement since the aircraft is not only too small to carry documentation, the documentation would not be available to the crew during flight operations. To obtain an equivalent level of safety and meet the intent of 91.9, we propose that a current, approved sUAS Flight Manual must be available to the crew at the ground station anytime the aircraft is in, or preparing for, flight.

14 CFR 91.109 Flight Instruction; Simulated instrument flight and certain flight tests
The regulation states that "No person may operate a civil aircraft that is being used for flight instruction unless that aircraft has fully functioning dual controls." Training will be conducted at a local Limited Access flying field. 417 Drone Imaging has the ability to provide "dual controls" utilizing two transmitters with a wireless link between the transmitters. One transmitter is designated the master transmitter and the other transmitter is designated as a slave. The PIC instructor, utilizing the master transmitter, will be at all times be able assume control of the sUAV.

91.119 Minimum safe altitudes:
General. The regulation states that over sparsely populated areas the aircraft cannot be operated closer than 500 feet to any person, vessel, vehicle, or structure. Since the typical mission of the sUAS would be photography or survey of persons, vessels, vehicles or structures it would be necessary to operate closer than 500 feet to the items listed. Operations will only be flown over property or persons where permission has been obtained and careful pre-planned flight path has been performed. The aircraft will be operated at a low altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface. Therefore we maintain that due to the small size of the UAS, the hazard to persons, vehicles and structures is minimal compared to manned aircraft, which should be considered in granting the exemption.

CFR 91.121 Altimeter settings.
The regulation requires that aircraft shall maintain cruising altitudes by reference to an altimeter setting available within 100 NM of the aircraft. The sUAS will always fly below 400 feet AGL and will not need to maintain cruising altitudes in order to prevent conflict with other aircraft. An Above Ground Level altimeter measurement above the takeoff point is transmitted via radio from the sUAS on-board computer to the display screen held by the PIC, providing a constantly updated AGL readout.

14 CFR 91.151 Fuel requirements for flight in VFR conditions.
The regulation provides that no person may begin a flight in an airplane under day-vFR conditions unless there is enough fuel to fly to the first point of intended landing and to fly after that for at least 30 minutes. We feel the intention of this paragraph is to provide an energy reserve as a safety buffer for delays to landing. The sUAV is battery operated and the maximum duration of flight from a single battery charge is 12 minutes with a 20% reserve. Since the aircraft will never fly more than 3/4 NM from the point of intended landing, a full battery charge at launch will ensure that we meet the reserve energy requirement of this paragraph. We request an exemption to the word "fuel" and ask for an equivalent interpretation with the word "energy".

14 CFR 91.203(a) & (b) Civil aircraft: Certifications required.
The regulation provides that an airworthiness certificate, with the registration number assigned to the aircraft and a registration certificate must be aboard the aircraft. Additionally, subparagraph (b) provides that the airworthiness certificate be "displayed at the cabin or cockpit entrance so that it is legible to passengers or crew." At a maximum gross weight of 6.1 pounds, the sUAS is too small to carry documentation, does not have an entrance, and is not capable of carrying passengers or crew. To obtain an equivalent level of safety and meet the intent of 91.203, we propose that documents deemed appropriate for this aircraft by the FAA will be with the crew at the ground control station and available for inspection upon request. In order to identify the aircraft, we propose that the information found on airworthiness and registration certificates be permanently affixed to the aircraft via placard containing the following information plus the word "EXPERIMENTAL" to satisfy the requirement of 14 CFR 45.23.

14 CFR 91.205(a), (b), (c) Instrument and Equipment Requirements
This regulation provides a minimum set of instruments and equipment required for day and night VFR flight. Due to the small size of the sUAS it would be impossible to carry many of these instruments. 91.205 (b) 4,5,6,7,8,13,14,16,17 are not applicable as the sUAS has no Reciprocating engines or seats. 91.205 (b) 2,3,9 are provided on the hand held controller. 91.205(b) 1 is not applicable as the maximum available speed of the sUAS is less than the maximum required by this exemption and has no effect on performance. 91.205 (b) 10 is not applicable as the landing gear position can be verified visually before landing. 91.205 (b) 15 Due to the size it would be impossible for the sUAS to carry any known ELT. 91.205 (c) Much of this equipment is too heavy to be carried by the sUAS. We feel that visual contact with the sUAS and indications provided via the controller that all critical information can be monitored.

14 CFR Subpart E (91.401- 91.417)- Maintenance, Preventive Maintenance, Alterations
The regulation provides that the operator is primarily responsible for maintaining the aircraft in an airworthy condition, including compliance with part 39 and 43. Paragraphs 91.407 and 91.409 require that the aircraft be "approved for return to service by a person authorized under 43.7" after maintenance and inspection. It is our intention that the PIC perform maintenance and inspection of the aircraft and "be authorized to approve the aircraft for return to service." The PIC will ensure that the aircraft is in an airworthy condition prior to every flight and in addition conduct detailed inspections after every two hours of flight. Maintenance performed by the PIC is limited to repairing small cracks, replacing a propeller, checking electrical connections and updating software and firmware for the on-board computer. All other maintenance will be performed by the manufacturer or their designated repair facility. We feel that due to the size, construction, and simplicity of the aircraft, the PIC can ensure an equivalent level of safety.

Safety and Benefits of the UAS
417 Drone Imaging, LLC 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 417 Drone Imaging, LLC‘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. 417 Drone Imaging, LLC 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

As pointed out in this application, all the SUAs which our company would use, under authorization by the US DOT-FAA, are small, light-weight devices operated within the line of sight of the Pilot-in-Command (PIC), less than 400 feet above the ground and outside 5 miles from any airport, heliport, seaplane base, spaceport, or other location with aviation activities, unless the air traffic control authorities (ATC) have been notified and have authorized each flight within a radius of this distance.

All our SUAs have proven capability for controlled flight. They are devices offered for general sale on the market around the world and have often been used as Model Aircraft in the USA. We are certain that the studies conducted until now by the FAA, about Section 332, Public Law 112-95, 2014, have already provided you with the assurances on the airworthiness of SUAs such as ours.

For the foregoing reasons, the exemptions requested herein should be granted and 417 Drone Imaging LLC 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. The submission of this application and its contents is the best demonstration that indeed it is possible to pursue the authorization process so that some SUAs may be used for legitimate commercial activities and under reasonably safe conditions. If any individual aspect of this request for exemption be unacceptable we ask that it be struck alone and the remainder of the exemption be allowed as requested.

Signed
William J. Preston
417 Drone Imaging