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

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

July 28, 2015

Exemption No. 12203
Regulatory Docket No. FAA–2015–1876

Mr. Ralph Rebaya
Owner and Chief Pilot
Heli Watch, Inc.
6444 East Spring Street #324
Long Beach, CA 90815-1553

Dear Mr. Rebaya:

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 May 10, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Heli Watch, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial videography and photography.

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.

Airworthiness Certification

The UAS proposed by the petitioner are the DJI Phantom and DJI S900.

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[1]. 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.

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, Heli Watch, Inc. 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. This exemption is subject to the conditions and limitations listed below.

[1] 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.

Conditions and Limitations

In this grant of exemption, Heli Watch, Inc. 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 Phantom and DJI S900 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 not 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 July 31, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

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

May 10, 2015

Dear Sir or Madam,

Heli Watch, Inc. ("Heli Watch") is submitting this petition on its own behalf, without legal counsel or consultation, in accordance with the terms set forth in Section 333 of the FAA Modernization and Reform Act of 2012 ("Reform Act") and 14 C.F.R. Part 11. Heli Watch requests an exemption from the Federal Aviation Regulations ("FARs") described below as they pertain to the operation of small Unmanned Aerial Systems ("UAS").

Heli Watch, Inc. is seeking said exemptions to commercially operate its small UAS within the National Airspace System (NAS) for the purpose of providing aerial videography and photography services. All Heli Watch flight operations will be performed by a two-person flight team and will be conducted in accordance with Section 333 of the Reform Act as set forth by the Federal Aviation Administration ("FAA")

Pursuant to 14 C.F.R. § 11.81(f), Heli Watch is providing the following summary for publication in the Federal Register to be included at the discretion of the FAA:

> Docket Number: No. FAA-2014-_____
> Petitioner: Heli Watch, Inc.
> Seeking Exemptions from Sections of 14 C.F.R: 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. § 61.133(a), 14 C.F.R. § 91.109(a), 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. § 91.215, 14 C.F.R. § 91.401 through 91.417, 14 C.F.R. § 91.7(a) and (b).
> Description of Relief Sought: Heli Watch, Inc. is requesting an exemption from sections of Title 14 of the Code of Federal Regulations to operate small (55 lbs. gross weight or less) unmanned aircraft systems under the control of licensed private pilots.

The Heli Watch petition is significantly similar in scope to the exemption granted to Astraeus Aerial under Exemption No. 11062 (Regulatory Docket No. FAA-2014-0352) and the associated Summary Grants (Regulatory Docket Nos. FAA-2014-0353, FAA-2014-0354, FAA-2014-0356, FAA-2014-0357 and FAA-2014-0358). Where applicable, Heli Watch will adhere to the terms set forth in the Astraeus exemption. When applicable, Heli Watch will also modify its training, maintenance and operations procedures to comply with future regulations set forth by the FAA as UAS law is implemented.

Heli Watch has received several inquiries, and has had initial conversations, regarding its services from companies in Mexico and Canada and would like to request consideration to exercise the privileges of any exemption outside of the United States.

The petitioner contact information for Heli Watch is:

Heli Watch, Inc.
6444 E. Spring St. #324
Long Beach, CA 90815-1553
Attn: Ralph Rebaya
Phone: (562) 833-2817
Email: Ralph@heliwatch.com

Heli Watch is requesting exemptions from the following regulations:

- 14 C.F.R. Part 21
- 14 C.F.R. § 45.23(b)
- 14 C.F.R. § 61.113(a) and (b) and 14 C.F.R. § 61.133(a)
- 14 C.F.R. § 91.109(a)
- 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. § 91.215
- 14 C.F.R. § 91.401 through 91.417
- 14 C.F.R. § 91.7(a) and (b)

GENERAL RESTRICTIONS AND ASSURANCES

Using FAA Notice on National Policy N 8900.227, "Unmanned Aircraft Systems (UAS) Operational Approval" and Exemption No. 11062 as guidance, Heli Watch will document and implement policies and training to ensure compliance with N 8900.227 Section 14 "Operational Requirements for UAS" and including the following restrictions:

(a.) All flight operations will be performed by a minimum of two (2) individuals: a Pilot in Command (PIC) and a Visual Observer (VO).

(b.) PIC will conduct a pre-flight briefing with VO and client or their designee to review flight profile, safety considerations and emergency procedures.

(c.) PIC will perform a pre-flight inspection of the UAS that includes: the communications link between the UA and ground control station, remaining battery charge, condition of airframe, propellers and wiring.

(d.) During flight, PIC and VO will maintain direct communications and terminate flight operations if they are no longer able to communicate with each other.

(e.) Unmanned Aircraft (UA) shall not exceed 55 pounds gross vehicle weight (including any attached cameras, gimbals or other equipment).

(f.) All flight operations will take place in Class G airspace no further than ¾ nm from the PIC, below 400 feet AGL and at airspeeds less than 25 kts.

(g.) All flight operations will take place under VFR conditions within visual line of sight (VLOS) of the PIC. No flight operations will take place at night.

(h.) Flight operations will not be conducted over densely populated areas, heavily trafficked roads, at an air show or other environment that may include other low-flying aircraft, or within 5 nm of an airport or heliport.

(i.) No flight operations will be conducted over an open-air assembly of people unless a comprehensive safety plan can be implemented to mitigate risk of injury to individuals or damage to property.

(j.) Flight operations will be terminated when the UA battery reaches a remaining charge of 20%.

Additional information regarding General Flight Operations, PIC and VO qualifications may be found in Appendix B: Heli Watch Equipment and Flight Operations Overview

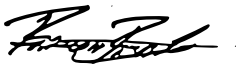
BENEFIT TO THE PUBLIC

The requested exemptions will allow Heli Watch to operate its UASs to provide commercial photography and videography services to its clients. In addition to advancing the "safe and expedient integration of UAS into the NAS" as mandated by the FAA Modernization and Reform Act of 2012, Public Law 112-95 (P.L. 112-95), granting the requested exemption is in the public interest as:

1. A UAS generates less pollution from exhaust, has a lower noise signature and requires a substantially smaller to footprint from which to operate, making it more cost-effective and environmentally friendly than full size, manned fixed-wing aircraft and helicopters.
2. A UAS uses either an electric power source or a significantly smaller amount of flammable fuel than a manned aircraft, making it a safer platform than its manned counterparts. The UAS described herein are also more maneuverable and provide a greater safety margin at the speeds and altitudes required for aerial cinematography than full size fixed- or rotary-wing aircraft.
3. When properly operated within the regulations set forth by the FAA, a UAS can be less disruptive to the NAS than its full-sized counterparts because it does not require airports/runways, fueling apparatus or other infrastructure required by manned aircraft.

Thank you for your review and consideration of this petition. Please contact us if you require any additional information to process this request.

Sincerely,



Ralph Rebaya, Owner and Chief Pilot
Heli Watch, Inc.

Attachments:
Appendix A: Exemption Request and Equivalent Safety Assurance
Appendix B: Heli Watch Equipment and Flight Operations Overview

APPENDIX A:

EXEMPTION REQUEST AND EQUIVALENT SAFETY ASSURANCE

Heli Watch respectfully requests an exemption from the following regulations for the unmanned aircraft systems (UAS) in its inventory.

14 C.F.R. Part 21, Airworthiness Certificates
This part prescribes, in significant part, the requirements for issuing or modifying design approvals, production approvals, airworthiness certificates and airworthiness approvals. It also establishes the rules governing applicants for and holders of certificates specified above.

Heli Watch requests an exemption from 14 C.F.R. Part 21 due to the size, construction materials and operational restrictions under which the UAS will operate. Additionally, the UAS will carry neither passengers nor flammable fuel, which will make it inherently safer than other aircraft holding an standard or experimental certification and performing the same operations under similar or less restrictive regulations.

If an exemption is not granted, Heli Watch intends to apply for an FAA airworthiness certification in the experimental category under 14 C.F.R. § 21.191.

14 C.F.R. § 45.23(b), Display of Marks; general
(a) Each operator of an aircraft must display on that aircraft marks consisting of the Roman capital letter "N" (denoting United States registration) followed by the registration number of the aircraft. Each suffix letter used in the marks displayed must also be a Roman capital letter.

(b) When marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted or light-sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "light-sport," "experimental," or "provisional," as applicable.

Heli Watch aircraft are unmanned and do not have a cockpit/entrance. Further, the size of the aircraft do not allow for 2 inch lettering. Heli Watch would display the word "Experimental" in a prominent location on the top of the UAS in as large a size as is practical to be prominent, but not interfere with operating the UA. Heli Watch would also include the word "Experimental" on the UAS ground control station from which the Pilot in Command (PIC) operates the aircraft.

14 C.F.R. § 61.113(a) and (b) and 14 C.F.R. § 61.133 (a), Private pilot privileges and limitations, Pilot in command; Commercial pilot privileges and limitations
14 C.F.R. § 61.113 states, in significant part, that a person holding a private pilot license is prohibited from acting as a PIC of an aircraft for compensation or hire, nor may that person, for compensation or hire, act as a PIC of an aircraft. Sub-part (b) prescribes, in significant part, exceptions for scenarios in which a PIC may be compensated.
14 C.F.R. § 61.113 prescribes, in significant part, when a person holding a commercial pilot license my act as a PIC of an aircraft for hire and the scenarios in which they may not act as a PIC for compensation.

Heli Watch UAs are unable to carry passengers or any cargo other than Heli Watch still and/or video cameras. Heli Watch requires that a PIC holds a private pilot license, which demonstrates an understanding of both the rules and best practices for maintaining safety and de-conflicting UAS operation from other users of the NAS. As there is not currently UAS pilot licensing or certification, the requirements to obtain a private pilot license and the additional qualifications required by Heli Watch establish an equivalent level of safety. UAS limitations are adequately addressed in the FARs addressing min/max altitude, prohibition of night flying and the requirement of operating only within visual line of sight (VLOS) of the UA.

14 C.F.R. § 91.109(a), Flight instruction; Simulated instrument flight and certain test flights
This section states, in significant part, that a civil aircraft being used for training or flight instruction must have either dual controls or a "throwover control wheel."

The UAS ground control station is a single control radio transmitter that does not accommodate a second set of controls. Any training of new PICs will be done in such a way that the trainer has positive, hands-on control of the UA should there be a need to take control from the trainee. Further, all training activities will take place in a location that adds to the equivalent level of safety intended by 14 C.F.R. § 91.109(a).

14 C.F.R. § 91.119, Minimum Safe Altitudes: General
(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.

Heli Watch anticipates operating UASs to film movie scenes, special events or other missions that will require operating below 500 feet and within 500 feet of people, vehicles or structures. Additionally, in accordance with FAA regulations for small UAS operation, maximum altitude for such operations is restricted to below 400 feet AGL.

Heli Watch will provide an equivalent level of safety by operating over authorized and participating individuals, vehicles or structures who are accounted for during the pre-flight planning and review process. Heli Watch will define divert areas to be used in the event that an emergency landing is required and will also operate at low enough altitudes so as to minimize risk to people and property on the ground.

14 C.F.R. § 91.121, Altimeter Settings
This section states, in sub-section (a)(1), that the PIC must maintain a cruising altitude via the use of an altimeter that is set to either the reported altimeter setting of a station along the route and within 100 nm of the aircraft, if unavailable, the PIC will use the reported altimeter setting of an appropriate available station.

Heli Watch UAS have instrumentation that reports Altitude, Airspeed, Temperature, and Voltage to the ground station.

Because the Heli Watch UA will operate well below 18,000 feet MSL, sub-section 2 is not relevant to this petition.

14 C.F.R. § 91.151(a), Fuel Requirements for flight in VFR conditions
(a) 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;

Heli Watch UAs operate on electrical battery, but the implied intent of this section is to ensure that adequate flight time is available to accommodate any delays in landing. For purposes of this petition, remaining battery charge is equivalent to remaining fuel.

The pre-flight check performed by the PIC will ensure that the UA has a full charge prior to takeoff, which will provide a minimum of 30 minutes of flying time. Landing procedures will be initiated with 20% charge remaining, or approximately 6 minutes of flight time. This margin will allow adequate time to ensure that the landing area is clear and safely land the UA, thereby providing an equivalent level of safety to the requirements set forth in 14 C.F.R. § 91.151(a).

Because the Heli Watch UA will operate only during daylight hours, sub-section (a)(2) is not relevant to this petition.

14 C.F.R. § 91.203(a) and (b), Civil aircraft: Certification required.
This section states, in significant part, an aircraft may not be operated without an airworthiness certificate and that furthermore, it may not be operated "No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under §91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew."

The Heli Watch UAs are unable to carry passengers or crew, do not have an entrance, cabin or cockpit and, due to their size, are too small to carry the documentation referenced in 14 C.F.R. § 91.203(a) and (b). In lieu of affixing the certificate to the UA, Heli Watch will display the registration number, the word "Experimental" and Heli Watch contact information on the UA. Additionally, the airworthiness certificate (if applicable – see request regarding 14 C.F.R. 91.7 below) and registration certificate will be on file and available for inspection at the control station.

14 C.F.R. Subpart E (91.401 through 91.417), Maintenance, Preventative Maintenance and Alterations
This regulation prescribes the responsibility for maintaining aircraft, requirements for returning an aircraft to service after maintenance or alterations, maintenance schedules and required documentation.

As compared to full-size, manned aircraft, the UAS operated by Heli Watch are relatively straightforward for trained individuals to inspect and maintain. PICs will inspect the major components including the air-ground communications, power plant, rotors/propellers, electrical connections and ensure that camera and gimbal equipment are firmly attached to the UA. Detailed inspections and preventative maintenance procedures that include partial tear-down of the UA will be performed after every 20 flight hours.

PICs will be able to perform basic maintenance such as tightening connections, repairing cracks that do not compromise airframe integrity, replacing components such as propellers or switching camera equipment. Upon completion of the basic maintenance, PICs will be authorized to re-inspect the UA, verify that it is airworthy and return it to service.

The Heli Watch Chief Pilot will perform any intermediate repairs or modifications, such as updating firmware or software or replacing general airframe. Any advanced repairs or rebuilding of components will by performed by the component manufacturer or their designated agent.

The PIC and Chief Pilot will be responsible for documenting all repairs or modifications performed on the UA.

The implementation of a maintenance schedule, thorough pre-flight inspections and the hierarchy assigned to the type of repair and which Heli Watch team member is authorized to perform the maintenance ensures an equivalent level of safety to the requirements set forth in 14 C.F.R. Subpart E (91.401 through 91.417).

14 C.F.R. § 91.7(a) and (b) Civil Aircraft Worthiness
(a) No person may operate a civil aircraft unless it is in an airworthy condition.

(b) The pilot in command of a civil aircraft is responsible for determining whether that aircraft is in condition for safe flight. The pilot in command shall discontinue the flight when unairworthy mechanical, electrical, or structural conditions occur.

A certificate as described in 14 C.F.R. 91.7 may not be available or applicable in the case of UAS and Heli Watch therefore requests an exemption to 14 C.F.R. § 91.7(a) and (b). However, the pre-flight check that the Heli Watch PIC will conduct prior to each flight cycle and the in-flight practices performed by the PIC and VO during flight operations will provide equivalent safety to this regulation.

APPENDIX B:

HELI WATCH EQUIPMENT AND FLIGHT OPERATIONS OVERVIEW

Heli Watch Unmanned Aircraft Systems (UAS)
The Heli Watch fleet includes a variety of small, Unmanned Aircraft ("UA") that are built on-site by an expert who has experience building manned experimental aircraft, large commercial aircraft and remotely-operated aircraft, or UAs. The various UA designs allow Heli Watch to employ equipment that best fits within a project's requirements and is least disruptive to the NAS and surrounding environment. The following small UAs and related components/equipment make up the Heli Watch fleet:

Quadcopter – Dji Phantom

Weight (Battery & Propellers included) = 1000g
Hover Accuracy (Ready to Fly)
- Vertical: 0.8m;
- Horizontal: 2.5m

Max Yaw Angular Velocity = 200°/s
Max Tilt Angle = 35°
Max Ascent / Descent Speed = Ascent: 6m/s; Descent: 2m/s
Max Flight Speed = 15m/s(Not Recommended)
Diagonal Length = 350mm
Flight Time = 25mins
Take-off Weight ≤1300g
Operating Temperature = -10°C ~ 50°C
Supported Battery = DJI Smart Battery
DJI Smart Battery
- 3S LiPo
- Capacity: 5200mAh, 11.1V
- Charging Environment Range: 0℃ to 40℃
- Discharging Environment Range: -20℃ to 50℃

2.4GHz Remote Control
- Operating Frequency: 2.4GHz ISM
- Communication Distance (open area): 1000m
- Receiver Sensitivity (1%PER): -97dBm
- Working Current/Voltage: 120 mA@3.7V
- Built-in LiPo Battery Working Current/Capacity: 3.7V, 2000mAh

Hex Copter: DJI S900

Diagonal Wheelbase: 900mm
Frame Arm Length: 358mm
Frame Arm Weight (Including Motor, ESC, Propeller): 316g
Center Frame Diameter: 272mm
Center Frame Weight (with Landing Gear Mounting Base, Servos): 1185g
Landing Gear Size: 460mm(Length)×450mm(Width)×360mm(Height)

Motor
- Stator Size: 41×14mm
- KV: 400rpm/V
- Max Power: 500W
- Weight(with Cooling Fan): 158g

ESC
- Working Current: 40A
- Working Voltage: 6S LiPo
- Signal Frequency: 30Hz ~ 450Hz
- Drive PWM Frequency: 8KHz
- Weight(with Radiators): 35g
- Foldable Propeller (1552/1552R)

Material
- High strength performance engineered plastics
- Size: 15×5.2inch
- Weight: 13g

Flight Parameters
- Takeoff Weight
- 4.7Kg ~ 8.2Kg
- Total Weight: 3.3Kg

Power Battery: LiPo (6S、10000mAh~15000mAh、15C(Min))
- Max Power Consumption: 3000W
- Hover Power Consumption: 1000W (@6.8Kg Takeoff Weight)
- Hover Time: 18min (@12000mAh& 6.8Kg Takeoff Weight)
- Working Environment Temperature: -10 °C ~ +40 °C

Heli Watch Flight Team Members
The Heli Watch flight team will include the following individuals for all events:

1. A Pilot in Command (PIC), whose primary responsibility will be the safe operation of the UAS in accordance with the FARs. The PIC will hold a minimum of an FAA Private Pilot License and the corresponding medical certificates to maintain said license.
2. A Visual Observer (VO), who will be responsible for ensuring that the UAS is being operated within the restrictions set forth in the FARs and to provide a second pair of eyes to mitigate any hazards to safe operations. If not a licensed pilot, the VO will receive orientation on the FAR and training on the responsibilities of an observer such as, but not limited to, flight team communications, properly monitoring the airspace and identifying hazards.
3. (Optional – if required and on a project-by-project basis) A Camera Operator, (CO) who will operate any still or video camera included in the UAS. The CO is not considered a part of the flight team, but will be used when a project requires a moving camera instead of one that it locked in a fixed position, or if terrain, proximity to non-Class G airspace or other environmental factors make the addition of a third team member prudent.

Heli Watch Flight Team Qualifications and Responsibilities
Each member of the Heli Watch flight team will meet a minimum set of qualifications, including FAA licenses and UAS operation training to ensure team and public safety. During operations, flight team members will be responsible for specific tasks to divide the workload and enhance safety.

Pilot in Command (PIC)
The PIC holds the proper licenses/certifications to conduct the flight and has final authority over all operations (regardless if UA is in the air at the time) and responsibility for safely operating the UA. A PIC will be designated prior to flight operations and only one person will be the designated PIC at any time.

At minimum, the PIC will possess the following:

- FAA Private Pilot License and required medical certifications
- The PIC will be qualified to operate the UA by possessing a minimum of 100 flight cycles and 25 hours of total time as a UA rotorcraft pilot and at least ten hours logged as a UA pilot with a similar UA type.
- Successful completion of Heli Watch training on the proper pre-flight inspection of UAs.

The PIC's duties include:

- Evaluating the environment for hazards
- Performing pre-flight checks and briefings
- Safely operating the UA within the FARs
- Coordinating with the VO to evaluate the operating area for safety
- Terminating flight operations and landing the UA as soon as practical and safe to do so if unsafe conditions arise.

Visual Observer (VO)
The VO is responsible for overseeing the safety aspects of UAS operations on each project and enforcing all FAA regulations set forth in the Reform Act.

At minimum, the VO will demonstrate knowledge of the requirements defined in 14 C.F.R. including: operations near other aircraft, right-of-way and basic VFR, plus the proper use of pilot/air traffic control phraseology. VOs who are not licensed private pilots will also complete a comprehensive Heli Watch training program to ensure that:

- The VO fully understands the FARs as they relate to the safe operation of a UAS and the importance of complying with them,
- The VO is familiar with crew resource management and clearly understands his/her role as it relates to the PIC,
- The VO is able to accurately read and interpret aeronautical charts, NOTAMs, COAs, weather forecasts and any other information required to ensure safe operations,
- The VO is able to effectively communicate and coordinate with the PIC to ensure a safe operating environment
- The VO has the opportunity to gain hands-on experience with a PIC, before participating on a paid project, to validate knowledge and address any questions or concerns in an environment that is dedicated solely to knowledge transfer between Heli Watch crew.

In addition to PIC and VO qualifications, the Heli Watch Chief Pilot possesses an extensive set of qualifications and experience from which training and oversight of flight operations will benefit:

The Chief Pilot (CP) is responsible for the construction, maintenance and safe operation of the Heli Watch UAS fleet. The CP possesses the following:

- FAA Private Pilot License with more than 20 years of flying experience
- B.S. degree in Mechanical Engineering
- M.S. degree in Aeronautical Science
- 15 years experience in the testing, maintenance and repair of commercial aircraft, which includes FAA-required documentation, while working for several major aircraft manufacturers
- 25 years experience building and maintaining manned experimental and small unmanned aircraft

Heli Watch Flight Operations

Pre-flight

The PIC and VO will conduct a pre-flight briefing that includes:

- Review aeronautical charts to
  - ensure that planned operating area is compliant with FARs
  - identify known hazards to navigation
  - determine safe divert areas (if applicable)
- Review weather forecasts
- Review all Notice to Airmen (NOTAM) that may be active in the operating area
- When required, obtain a Certificate of Waiver or Authorization (COA) from the regional ATO
- When required, submit a notice of planned operations to the appropriate Flight Standards District Office (FSDO) a NOTAM between 72 and 48 hours prior to commencing operations
- Perform a pre-flight maintenance check to ensure that the UAS is functioning according to manufacturer specifications including the communications link between the UA and ground control station, remaining battery charge, condition of airframe, propellers and wiring.
- Inspect the UA to comply with maximum weight limitations of 55 lbs. gross weight
- Display a sign or other notice indicating that UAS operations are in progress in the area and identifying Heli Watch as the owner/operator of the UAS. The ground control station is a portable unit that is worn by the PIC to ensure freedom of movement should repositioning be required to maintain proper visual line of sight. As such, the notification sign will be placed within 10 feet of the PIC's initial position and moved, as required, and never to exceed a distance of 20 feet from the PIC. Additionally, flight operations will primarily be conducted within a closed set environment or in an area where only authorized and consenting individuals are allowed.

In-flight

The PIC will operate the UAS in accordance with the FARs and Heli Watch pre-flight briefing described above to maintain public safety. During flight operations, the PIC will:

- Navigate the UAS within the operational area
- Monitor altitude and airspeed
- Maintain visual line of sight (VLOS) with the UA
- Monitor battery charge/remaining flying time

The VO will:

- Monitor UAS operations to cross-check PIC and ensure that the UA stays within VLOS and within the required altitude and airspeed limitations,
- Monitor the airspace to ensure that aircraft, birds or other airborne hazards remain out of the operating area,
- Monitor the general operating area to ensure that the UA maintains proper separation from hazards, restricted or unauthorized airspace and that no ground hazards, such as unauthorized persons or vehicle enter, the operating area,
- Monitor weather conditions to ensure that wind, cloud ceiling or other factors do not exceed safe operating parameters,
- Immediately instruct the PIC to terminate flight operations and assist the PIC to safely land the UA if any unsafe conditions arise.