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

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

May 14, 2015

Exemption No. 11581
Regulatory Docket No. FAA−2014−0874

Mr. Paul J. Fraidenburgh
Counsel for Mountain High Aviation, LLC
Buchalter Nemer
18400 Von Karman Avenue, Suite 800
Irvine, CA 92612

Dear Mr. Fraidenburgh:

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.

The Basis for Our Decision

By letter dated October 20, 2014, you petitioned the Federal Aviation Administration (FAA) on behalf of Mountain High Aviation, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial surveying, remote sensing, precision agriculture, aerial filmmaking and photography, public entity support operations, utility system inspections and patrolling, construction site inspection and monitoring, wildlife and forestry monitoring, educational and research operations, flare stack inspection, and pipeline inspection and patrolling.

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 S-1000, DJI Phantom 2, Riegl RiCopter, and ARF-MikroKopter OktoXL.

The petitioner requested relief from 14 CFR part 21, C*ertification 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, 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. 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, Mountain High Aviation, 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. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption, Mountain High Aviation, 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 are the DJI S-1000, DJI Phantom 2, Riegl RiCopter, and ARF-MikroKopter OktoXL 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 May 31, 2017, unless sooner superseded or rescinded.

Sincerely,

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

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U.S. Department of Transportation
Docket Management System
1200 New Jersey Ave., SE
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Mountain High Aviation, LLC's Petition for Exemption to Operate

Small Unmanned Aircraft Systems

FAA Regulatory Docket

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I. PETITION SUMMARY

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95 (2012), 126 Stat. 11 ("Section 333") and the Federal Aviation Administration's ("FAA") general exemption authority under 49 U.S.C. § 44701(f), Mountain High Aviation, LLC ("Petitioner") hereby petitions for exemptions from 14 C.F.R. Part 21, Subpart H (Airworthiness Certificates), 14 C.F.R. Part 27 (Airworthiness Standards: Normal Category Rotorcraft), 14 C.F.R. §§ 91.7(a), 91.9(b)(2), 91.103(b)(1), 91.109(a), 91.119(c), 91.121, 91.151, 91.203(a) and (b), 91.405(a), 91.407(a)(1) 91.409(a)(2), and 91.417(a)-(b). The proposed exemptions, if granted, would allow Petitioner to conduct commercial operations of small unmanned aircraft systems ("UAS") weighing 55 pounds or less.

Based on the small size of Petitioner's UAS, the qualifications and experience of Petitioner's pilot, and the limited environments within which Petitioner will operate, the requested exemptions fall squarely within the zone of safety envisioned by Congress and set forth in Section 333. Additionally, the enhanced safety achieved by replacing significantly larger manned aircraft carrying crew and flammable fuel with small UAS carrying no passengers or crew and operated under the specific guidelines and procedures proposed by Petitioner gives the FAA good cause to find that the UAS operations enabled by the instant Petition are in the public interest. Thus, the requested exemptions should be granted.

II. BACKGROUND

Petitioner is a multifaceted technology company that holds an FAA Part 135 Certificate and provides a broad range of remote sensing and aviation solutions to a variety of industries and government agencies. Petitioner seeks to build on its years of successful and safe operations and leverage its aviation skills and knowledge to offer the widest possible range of UAS services in a manner that is consistent with the intent of Congress in enacting Section 333. Petitioner seeks the requested exemptions and a Certificate of Authorization to permit Petitioner to offer on-demand commercial UAS operations for a host of industries and applications including:

- Aerial surveying
- Remote sensing
- Precision agriculture
- Aerial filmmaking and photography
- Public entity support operations
- Utility system inspections and patrolling
- Construction site inspection and monitoring
- Wildlife and forestry monitoring
- Educational and research operations
- Flare stack inspection, and
- Pipeline inspection and patrolling

Petitioner's team of pilots and technical experts have extensive experience in remote sensing, aviation, data collection, information technology, project management, and mechanical engineering. Petitioner's approach to UAS integration is aimed at building on Petitioner's preexisting infrastructure for operating within the National Airspace System ("NAS"), including, to the greatest extent possible, adopting Petitioner's safe operations procedures for Petitioner's Part 135 and special missions operations. This will allow Petitioner to fully integrate with the established systems that govern all air operations, whether conducted under Part 91 or Part 135.

III. STATUTORY AUTHORITY

A. Section 333

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 operational authorization."

Section 333(b) identifies several factors that the FAA should consider in determining whether commercial UAS operations should be approved. These include UAS that, "as a result of their size, weight, speed, operational capability, proximity to

airports and populated areas, and operation within visual line of sight do not create a hazard to users of the [NAS] or the public or pose a threat to national security." *See* Section 333(b).

B. Section 44701(f)

In addition to the specific authority conferred by Section 333, the FAA Administrator has general authority to grant exemptions from the FAA's safety regulations and minimum standards when the Administrator decides a requested exemption is in the public interest. *See* U.S.C. § 44701(f).

IV. REQUESTED EXEMPTIONS

Petitioner requests relief from the following regulations:

Part 21 prescribes, in pertinent part, the procedural requirements for issuing and changing design approvals, production approvals, airworthiness certificates, and airworthiness approvals.

Part 27 sets forth airworthiness standards for normal category rotorcraft.

Section 91.7(a) prescribes, in pertinent part, that no person may operate a civil aircraft unless it is in an airworthy condition.

Section 91.9(b)(2) prohibits operation of U.S. registered civil aircraft unless there is available in the aircraft a current approved Airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

Section 91.103(b)(1) prescribes, in pertinent part, that each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight, to include, "For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:… For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein."

Section 91.109(a) provides that "[n]o person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls."

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

Section 91.121 requires, in pertinent part, each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "to the elevation of the departure airport or an appropriate altimeter setting available before departure."

Section 91.151(a) prescribes that no person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising

speed, (1) during the day, to fly after that for at least 30 minutes; or (2) at night, to fly after that for at least 45 minutes.

Section 91.203 prohibits, in subpart (a), any person from operating a civil aircraft unless it has within it (1) an appropriate and current airworthiness certificate; and (2) an effective U.S. registration certificate issued to its owner or, for operation within the United States, the second copy of the Aircraft Registration Application as provided for in § 47.31(c). Section 91.203 prescribes, in subpart (b), that no person may operate a civil aircraft unless an airworthiness certificate or a special flight authorization issued under § 91.715 legible to passengers or crew is displayed at the cabin or cockpit entrance.

Section 91.405(a) requires, in pertinent part, that an aircraft operator or owner shall have the aircraft inspected as prescribed in subpart E of the same part and shall, between required inspections, except as provided in paragraph (c) of the same section, have discrepancies repaired as prescribed in Part 43 of the chapter.

Section 91.407(a)(1) prohibits, in pertinent part, any person from operating an aircraft that has undergone maintenance, preventative maintenance, rebuilding, or alteration unless it has been approved for return to service by a person authorized under § 43.7 of the same chapter.

Section 91.409(a)(2) prescribes, in pertinent part, that no person may operate an aircraft unless, within the preceding 12 calendar months, it has had an inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.

Section 91.417(a) and (b) prescribes, in pertinent part, that-

(a) Each registered owner or operator shall keep the following records for the periods specified in paragraph (b) of this section:

(1) Records of the maintenance, preventative maintenance, and alteration and records of the 100-hour, annual, progressive, and other required or approved inspections, as appropriate, for each aircraft (including the airframe) and each engine, propeller, rotor, and appliance of an aircraft. The records must include-

(i) A description (or reference to data acceptable to the Administrator) of the work performed; and

(ii) The date of completion of the work performed; and

(iii) The signature, and certificate number of the person approving the aircraft for return to service.

(2) Records containing the following information:

(i) The total time in service of the airframe, each engine, each propeller, and each rotor.

(ii) The current status of life-limited parts of each airframe, engine, propeller, rotor, and appliance.

(iii) The time since last overhaul of all items installed on the aircraft which are required to be overhauled on a specified time basis.

(iv) The current inspection status of the aircraft, including the time since the last inspection required by the inspection program under which the aircraft and its appliances are maintained.

(v) The current status of applicable airworthiness directives (AD) and safety directives including, for each, the method of compliance, the AD or safety directive number and revisions date. If the AD or safety directive involves recurring action, the time and date when the next action is required.

(vi) Copies of the forms prescribed by § 43.9(d) of this chapter for each major alteration to the airframe and currently installed engines, rotors, propellers, and appliances.

(b) The owner or operator shall retain the following records for the periods prescribed:

(1) The records specified in paragraph (a)(1) of this section shall be retained until the work is repeated or superseded by other work or for 1 year after the work is performed.

(2) The records specified in paragraph (a)(2) of this section shall be retained and transferred with the aircraft at the time the aircraft is sold.

(3) A list of defects furnished to a registered owner or operator under § 43.11 of this chapter shall be retained until the defects are repaired and the aircraft is approved for return to service.

V. PETITIONER'S PROPOSED OPERATIONS SATISFY SECTION 333.

A. Unmanned Aircraft System

Petitioner intends to operate several small UAS under the requested exemptions. Thus, the following specifications and limitations apply to all UAS for which Petitioner herein seeks an exemption.

The UAS to be operated under this request will be less than 55 lbs. fully loaded, will be operated at a speed of no more than 50 knots, will carry neither a pilot nor passenger and no explosive materials or flammable liquids, and will be operated exclusively in predetermined environments that are controlled as to access. Petitioner's UAS will use a radio frequency spectrum for operation and control that complies with Federal Communications Commission ("FCC") requirements, and will be operated only

in accordance with the procedures described in Petitioner's Flight Operations and Procedures Manual ("FOPM").[1]

Petitioner's UAS will be equipped with redundant safety mechanisms allowing safe operation after experiencing certain in-flight failures. If a lost-link event occurs, including the loss of ground communications and/or the loss of a GPS signal, Petitioner's UAS will have the ability to perform a pre-coordinated, predictable, automated flight maneuver and return to a predetermined location within a designated security perimeter for landing. The UAS will further have the ability to abort a flight in the event of unpredicted obstacles or emergencies. The maximum total flight time for each operational flight will be limited to the amount of time the UAS can be flown and still maintain a reserve battery power of no less than 25%. Thus, good cause exists for granting Petitioner's requested relief from 14 C.F.R. § 91.151(a) (setting forth fuel requirements for flight in VFR conditions).

Regarding Petitioner's requested exemption from 14 C.F.R. Section 91.109(a), UAS, by their design, typically do not have functional dual controls. Given the size and speed of the UAS, an equivalent level of safe training can be performed without dual controls because no pilot or passengers are aboard the UAS and all persons will be a safe

[1] The FOPM will be submitted separately and confidentially under 14 C.F.R. 11.35(b), as the manual contains proprietary information that the applicant has not and will not share with others. The manual contains operating conditions and procedures that are not available to the public and are protected from release under the Freedom of Information Act, 5 U.S.C. §§ 552, et seq.

distance away in the event that the UAS experiences any difficulties during flight instruction. The FAA has approved exemptions for flight training without fully functional dual controls for a number of aircraft and for flight instruction in experimental aircraft. *See* Exemption Nos. 5778K and 9862A. Thus, good cause exists for granting the requested relief from 14 C.F.R. § 91.109(a).

Petitioner's UAS will be identified by serial number, registered in accordance with 14 C.F.R. Part 47, and have identification (N-Number) markings in accordance with 14 C.F.R. Part 45, Subpart C. Markings will be as large as practicable.

Regarding Petitioner's requested relief from 14 C.F.R. § 91.121 (Altimeter Settings), Petitioner seeks such relief because Petitioner will not have a typical barometric altimeter onboard the UAS. Instead, altitude information will be provided to the UAS PIC via a digitally encoded telemetric data feed, which downlinks from the aircraft to a ground-based on-screen display. The altitude information will be generated by equipment installed onboard the UAS, using GPS triangulation, digitally encoded barometric altimeter, radio altimeter, or any combination thereof. Prior to each flight, a zero altitude initiation point will be established and confirmed for accuracy by the UAS PIC. Thus, good cause exists for granting the requested relief from 14 C.F.R. § 91.121.

Given the size, weight, speed, and limited operating area associated with the aircraft to be utilized by the applicant, an exemption from 14 C.F.R. Part 21, Subpart H (Airworthiness Certificates), subject to certain conditions and limitations, is warranted (if

necessary) and meets the requirements for an equivalent level of safety under 14 C.F.R. Part 11 and Section 333. The UAS operated without an airworthiness certificate in the restricted environment and under the conditions and limitations proposed by Petitioner will be at least as safe, or safer, than a conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate issued under 14 C.F.R. Part 21, Subpart H, and not subject to the proposed limitations and conditions.

Petitioner will strictly comply with safety and maintenance procedures included in all applicable UAS manufacturer's instructions and operating manuals. To the extent such information is not included in the guidelines developed by the manufacturers, Petitioners will develop and document maintenance, overhaul, replacement, and inspection requirements, procedures to document and maintain maintenance records with regard to Petitioner's UAS, and UAS technician qualification criteria. Petitioner's operations manuals will include maintenance requirements for Petitioner's UAS, including "on-condition" maintenance and modifications. In light of these mitigating factors, exemptions from 14 C.F.R. §§ 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b) are warranted.

Regarding Petitioner's requested relief from 14 C.F.R. § 91.7(a), it is Petitioner's understanding that, in light of the operating parameters defined herein, Petitioner's UAS may not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H, and exemption from 14 C.F.R. § 91.7(a) may be unnecessary. *See, e.g.,*

Exemption No. 11062, Regulatory Docket No. FAA-2014-0352 (explaining no such exemption was necessary for the requested UAS operations). To the extent such an exemption is deemed necessary in this instance, Petitioner asserts that it should be granted in light of the safety procedures proposed herein. In accordance with the pertinent part of 14 C.F.R. § 91.7(b), the PIC shall be responsible for determining whether the aircraft is in a safe condition for flight. Petitioner's manuals for maintenance and operations shall include safety checklists to be used by the PIC prior to each flight.

Regarding Petitioner's requested relief from 14 C.F.R. § 91.9(b)(2) (Civil aircraft flight manual, marking, and placard requirements) and § 91.203(a) and (b), (Civil aircraft: certifications required), it is Petitioner's understanding that relief from these regulations is no longer necessary in light of the FAA Memorandum "Interpretation regarding whether certain required documents may be kept at an unmanned aircraft's control station," dated August 8, 2014. To the extent the FAA deems an exemption from this section necessary for Petitioner's proposed operations, such exemption should be granted in light of the mitigating fact that Petitioner will maintain the documents required under 14 C.F.R. §§ 91.9 and 91.203 at the UAS ground control station during flights.

B. UAS Pilot in Command

Petitioner's UAS pilot in command (PIC) will be Petitioner's Managing Director, Owner, CEO, and Special Missions Pilot, Joseph Hovelman. Mr. Hovelman has over 23 years of experience in the aviation industry as a research and chief pilot, director of flight

operations, and project manager. Mr. Hovelman's responsibilities have included management of domestic and international flight operations utilizing fixed wing aircraft, helicopters, pilots, and mechanics. Mr. Hovelman has been responsible for experimental research modifications of aircraft helicopters and marine survey vessels, and has served as Chief Pilot for production level wide area assessment and UXO data collection survey flights throughout North America. In addition, Mr. Hovelman has served as Chief Pilot for projects conducted on behalf of the National Aeronautics and Space Administration ("NASA"), the U.S. Department of Energy, U.S. Air Force, U.S. Navy, Stanford Research Institute & University, as well as several other public agencies and private companies. Highlights of Mr. Hovelman's training and certifications include:

- Airline Transport Pilot, Multi Engine Land, Commercial Privileges with Instrument Rating:
  - Type rated in JS-3101/02, 850 Hrs.
  - Pilatus PC-12, 1700 Hrs.
  - King Air B200/C12, 600 Hrs.
  - Queen Air B80, 400 Hrs.
  - Cessna C-208 Caravan, 2,000 Hrs.
  - Cessna 152/172/182/206/210/337
  - SR-22 Cirrus GTS, 100 Hrs.
  - Multiple other aircraft;

- 5,500 Flight hours of survey, research and development and experimental test pilot experience;
- Department of Defense Secret Security Clearance, United States Government – Current; and
- Multiple professional pilot courses, initial and recurrent, Flight Safety International ProCard, SimCom Int.

Highlights of Mr. Hovelman's pertinent experience include:

- Director of Flight Operations/Chief Pilot on multiple simultaneous projects with multiple aircraft and pilots;
- Project execution and oversight as Chief Pilot/Director of Marine and Flight Operations USACE specific projects, such as Ortho/LiDAR, HeliMag, SAR Radar, and MarineMag;
- Flown hundreds of missions and millions of acres of Ortho/LiDAR, P-Band SAR, Hyperspectral and Thermal data collection flights;
- Managed and flew as lead research pilot over 50 NASA missions involving pollution studies, forest fire mapping, and UAV electronics testing and development; and
- Systems design lead on multiple airborne, ground, and marine platforms.

Additionally, 100% of Petitioner's operations will utilize a visual observer ("VO"). The VO may be used to satisfy the VLOS requirement as long as the PIC

always maintains VLOS capability. The VO and the PIC will be able to communicate verbally at all times during operational flights.

Regarding Petitioner's requested relief from 14 C.F.R. § 91.103(b)(1), Petitioner will comply with the other applicable procedures and requirements stated in § 91.103(a) and (b). Specifically, the PIC will take all actions including reviewing weather, flight battery requirements, aircraft performance data, and landing and takeoff distances before initiation of a flight. The PIC will also account for all relevant site-specific conditions in their preflight procedures. Risks presented by sun glare will be mitigated by the PIC's and VO's ability to see other air traffic and initiate a return-to-home sequence if needed.

C. Operating Parameters of Petitioner's UAS

Petitioner's UAS operations will be conducted within a predetermined, access controlled environment. In this controlled environment, Petitioner's operations will remain within VLOS of the PIC and/or VO, below 400 feet AGL, and at speeds below 50 knots. Flights will be operated at a lateral distance of no less than 100 feet from any inhabited structures, buildings, vehicles, vessels, or nonparticipating persons. The UAS will operate in accordance with the safety and operational requirements of the FOPM. Prior to the operation, a Safety Risk Analysis Plan ("SRAP") will be created which includes all safety and operational information necessary to safely carry out the flight. When applicable, all UAS operations will be conducted in accordance with any state or local privacy laws.

Only participating persons will be permitted within the operating area.[2] As to Petitioner's filming operations, and consistent with the relief typically provided to manned operations under FAA Order 8900.1, Volume 3, Chapter 8, Section 1, Petitioner requests relief from 14 C.F.R. § 91.119(c) with respect to those participating persons, vehicles, and structures directly involved in the performance of the actual filming. Regarding distance from participating persons, the operations manual sets forth safety factors for authorized and consenting production personnel. Because those procedures are specific to participating persons, no further FSDO or aviation safety inspector approval is necessary for reductions to the distances specified in Petitioner's manual.

Although Petitioner seeks to comply with the waiver process as described in FAA Order 8900.1, Volume 3, Chapter 8, Section 1 (Issue a Certificate of Waiver for Motion Picture and Television Filming), the current section of Order 8900.1 has specific processes that preclude a jurisdictional FAA FSDO from issuing the required Certificate of Waiver, because the section did not originally provide for UAS operations. Thus, Petitioner seeks exemption from the applicable regulations normally waived during that process. Petitioner proposes that the FAA include the required notifications and coordination with jurisdictional FSDOs through the conditions and limitations accompanying the requested exemption, and that the exemption sought herein will take

[2] Pursuant to Order 8900.1 V3, C8, S1, as applicable to aerial filming operations, "participating persons" includes all persons associated with the production. Participating persons will be briefed on the potential risk of the proposed flight operations and must acknowledge and accept those risks prior to participation.

the place of the Certificate of Waiver normally issued by a jurisdictional FSDO under 8900.1. Under this rubric, for aerial filming operations, Petitioner will notify every FSDO with jurisdiction over the area that Petitioner plans to operate, just as with manned filming operations, and those FSDOs will have the ability to coordinate further conditions and limitations with the UAS Integration Office to address any local concerns.

Petitioner's UAS will remain clear and yield the right of way to all manned operations and activities at all times (including, but not limited to, ultralight vehicles, parachute activities, parasailing activities, and hangliders). Petitioner will not conduct UAS operations within 5 nautical miles of the geographic center of a non-towered airport unless a letter of agreement with that airport's management is obtained and the operation is conducted in accordance with a Notice to Airmen ("NOTAM").

Petitioner will obtain an Air Traffic Organization ("ATO") issued Certificate of Waiver or Authorization ("COA") prior to conducting any operations under this grant of exemption. In fulfilling its requirements under the COA, Petitioner will be required to request a NOTAM not more than 72 hours in advance, but not less than 48 hours prior to the operation.

D. The Requested Exemption Promotes the Public Interest

The enhanced safety achieved by replacing significantly larger manned aircraft carrying crew and flammable fuel with small UAS carrying no passengers or crew and operated under the specific guidelines and procedures proposed by Petitioner gives the

FAA good cause to find that the UAS operations enabled by the instant Petition are in the public interest. Moreover, as the FAA has already recognized, UAS provide "a greater degree of flexibility, which supplements the current capabilities offered by manned aircraft." *See* Exemption No. 11062, Regulatory Docket No. FAA-2014-0352, at p. 22.

By granting Petitioner's requested exemptions, the FAA will help drive development of safe and successful commercial UAS operations and will advance the public knowledge base for such operations. Petitioner is committed to promoting the UAS research efforts of policymakers including the FAA, NASA, and DOD 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.

VI. CONCLUSION

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

Respectfully submitted,

BUCHALTER NEMER
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By 

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