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

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

June 16, 2015

Exemption No. 11835
Regulatory Docket No. FAA–2015–1161

Ms. Mary B. Wohnrade, P.E.
Principal
Wohnrade Civil Engineers, Inc.
11582 Colony Row
Broomfield, CO 80021

Dear Ms. Wohnrade:

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 March 27, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Wohnrade Civil Engineers, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct site reconnaissance for public and private civil construction projects, including bridge inspections and aerial photography and videography.

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 is a DJI Inspire 1.

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, Wohnrade Civil Engineers, 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, Wohnrade Civil Engineers, 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 Inspire 1 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 June 30, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

Wohnrade Civil Engineers, Inc.

March 27, 2015

Docket Operations, M-30
U.S. Department of Transportation
1200 New Jersey Avenue, SE., Room W12-140
West Building Ground Floor
Washington, DC 20590-0001

Subject: Section 333 Petition for Exemption 14 CFR § 11.81
Electronic Submittal – Via FDMS Website

Dear Staff:

This letter serves as a petition for exemption from specific rules contained in Title 14 of the Code of Federal Regulations (14CFR), regarding the operation of a small, unmanned aircraft system (small UAS) in the National Airspace System (NAS). This petition has been prepared and filed in accordance with 14 CFR § 11.81.

Operation of the Unmanned Aircraft

The UAS will be used for civil operations by Wohnrade Civil Engineers, Inc., a professional civil engineering consulting firm, for the propose of conducting site reconnaissance for both public and private civil construction projects, including bridge inspections. The UAS will be used to gather aerial still photography, and videos for use in engineering studies pertaining to hydrology and floodplain modeling. These operations would benefit the public as a whole by enabling enhanced acquisition of existing topography for use in the preparation of detailed engineering studies. Aerial photography would also serve as a historical record, which is commonly shared with federal, state, and local agencies.

We intend to implement all of the *Operational Limitations*, outlined in Proposed Part 107 of the Notice of Proposed Rulemaking (NPRM), at a minimum. These limitations will ensure the same level of safety offered by the rules for which the exemption is sought. By adhering to the *Operational Limitations*, the proposed UAS operation will minimize risk to the NAS, and to persons and property on the ground. The UAS will be operated in Class G airspace only, and flights will not exceed 200 feet in elevation above ground level.

Operations will be limited to daylight-only in Class G airspace, using visual line-of-sight (VLOS), in sparsely populated areas. Operations will also remain:

- 5 nautical miles (NM) from an airport having an operational control tower; or
- 3 NM from an airport with a published instrument flight procedure, but not an operational tower: or
- 2 NM from an airport without a published instrument flight procedure or an operational tower; or
- 2 NM from a heliport with a published instrument flight procedure.

11582 Colony Row, Broomfield, Colorado 80021
Phone: 720-259-0965

Prior to each flight, the Pilot In Command (PIC) will perform a preflight inspection of the UAS, and follow the manufacturer's preflight checklist. In addition, an Airplane Flight Manual/Inspire 1 User Manual (AFM) will also be available for each flight.

The UAS specifications can be found in the Inspire 1 User Manual, which has been included in this submittal. The aircraft loads will include a video camera, and intelligent flight battery, and are included in the total weight of the aircraft, which is roughly 6.5 lbs. The Inspire 1 Safety Guidelines also provide recommendations for the safe operation of the UAS, and potential hazards.

Unmanned Aircraft Pilot in Command (PIC)

The Pilot in Command (PIC) will be Mary B. Wohnrade, who holds a private pilot license for single engine land aircraft, Certification Number 332548448. Ms. Wohnrade has logged 87 hours of flight time in a fixed-wing single-engine aircraft. She holds no current medical certificate. As pilot in command, she will assume the final authority and responsibility for the operation and safety of the flight. She will also be responsible for staying abreast of the latest FAA regulations, through the "Know Before You Fly" program.

Unmanned Aircraft System

The UAS will be the Inspire 1, which is manufactured by DJI. All manufacturers recommendations related to safety guidelines will be referenced to ensure the safe operation of the small UAS in the NAS. This includes all DJI instructional videos, and written Safety Guidelines for the Inspire 1.

As PIC, Ms. Wohnrade will implement the *Operational Limitations* outlined in Proposed Part 107 of the Notice of Proposed Rulemaking (NPRM), Volume 80, No. 35 of the Federal Register, dated Monday, February 23, 2015. The small UAS will be operated by dual controls. One operator will control the flight of the UAS, and the second operator will control the camera mounted on the UAS.

Maintenance and repair will be performed as necessary, and a maintenance record will be recorded in a repair logbook. This will ensure that the UAS is in a safe condition for flight. The Maintenance Manual for the Inspire 1 will be used as a reference, and has been included in this submittal. The UAS will also be registered in accordance with Part 47 of the 49 UCS § 44711.

Rules for which we seek exemption are summarized below, and include:

1) 14 CFR, Part 21, Subpart H - ***Airworthiness Certificates***
   i. This section pertains to requirements for the issue of airworthiness certificates. Proposed Part 107 of the NPRM concluded that, requiring small UAS operators to conduct inspection and maintenance of the small UAS pursuant to the existing regulations of 14 CFR part 43, or to obtain a permit to operate (PTO), would not result in significant safety benefits.
2) 14 CFR, part 91 § 91.103- ***Preflight Action***
   i. This section pertains to preflight actions for IFR flights, and reviewing information related to runway lengths, and takeoff and landing distances. The small UAS will never be flown under IFR conditions, and takeoff and landing distances are not a factor on a rotorcraft. The small UAS will undergo a preflight assessment, which will include: (1) Local weather conditions; (2) local airspace and flight restrictions; (3) the location of persons and property on the ground; (4) any other ground hazards.
3) 14 CFR, part 91 § 91.109- ***Flight Instruction***

i. This section pertains to aircraft being used for flight instruction. The small UAS will not be used for flight instruction.

4) 14 CFR, part 91 § 91.119- ***Minimum Safe Altitudes***
   i. This section pertains to minimum altitudes for flight, which are a minimum of 500 feet above the surface, and greater. The small UAS will be flow at a maximum altitude of 500 feet above the surface. This rule would not be applicable to Proposed Part 107 of the NPRM.
5) 14 CFR, part 91 § 91.121- ***Altimeter Settings***
   i. This section pertains to cruising altitudes and flight levels as referenced by altimeter settings. In addition, the rule pertains to flights that are above a minimum altitude of 500 feet. The small UAS does not contain an altimeter, and will be flown at a maximum altitude of 500 feet. This rule would not be applicable to Proposed Part 107 of the NPRM.
6) 14 CFR, part 91 § 91.151- ***Fuel Requirements for VFR Conditions***
   i. This section pertains to fuel requirements in VFR conditions when flying an aircraft to the first point of intended landing. The small UAS will be flown on battery power, and will remain within a visual line-of-sight (VLOS) at all times. This rule would not be applicable to Proposed Part 107 of the NPRM.
7) 14 CFR, part 91 § 91.203(a)(1)- ***Civil Aircraft Certifications***
   i. This section pertains to airworthiness certificates originally designed for manned aircraft. It is not practically feasible for small UAS manufacturers to complete the certification process required of manned aircraft. Proposed Part 107 of the NPRM has accommodated non-recreational small UAS use through a certificate of waiver or authorization (COA). The UAS will be registered with the FAA, and a COA would be requested subsequent to the Section 333 exemption process.
8) 14 CFR, part 91 § 91.405- ***Maintenance Required***
   i. This section pertains to the maintenance of manned aircraft. Proposed Part 107 of the NPRM concluded that, requiring small UAS operators to conduct inspection and maintenance of the small UAS pursuant to the existing regulations of 14 CFR part 43, or to obtain a permit to operate (PTO), would not result in significant safety benefits.
9) 14 CFR, part 91 § 91.407- ***Operation After Maintenance, Preventative Maintenance***
   i. This section pertains to aircraft maintenance, preventative maintenance, and alterations for manned aircraft. The small UAS will not carry persons, and will not be altered to change flight characteristics.
10) 14 CFR, part 91 § 91.409- ***Inspections***
   i. This section pertains to manned aircraft inspections. Proposed Part 107 of the NPRM concluded that, requiring small UAS operators to conduct inspection and maintenance of the small UAS pursuant to the existing regulations of 14 CFR part 43, or to obtain a permit to operate (PTO), would not result in significant safety benefits.
11) 14 CFR, part 91 § 91.417- ***Maintenance Records***
   i. This section pertains to maintenance records for manned aircraft for the 100-hour, annual, and progressive periods. These rules are impractical for a small UAS, and would not result in significant safety benefits. Maintenance records for the small UAS will be kept as required.

Summary of Rules for Exemption:

Sections of 14 CFR: parts 21 and 91. Specifically including sections: part 21, Subpart H, § 91.103, § 91.109, § 91.119, § 91.121, § 91.151, § 91.203(a)(1), § 91.405, § 91.407, § 91.409, § 91.417.

Description of Relief Sought:

Mary B. Wohnrade, a professional civil engineer, is seeking an exemption to commercially operate a small unmanned aircraft system (sUAS), 15 pounds or less including payload, to perform various operations which include, but are not limited to: aerial acquisition and research in support of public and private civil construction projects, aerial photography for utility and irrigation companies, local infrastructure, engineering studies, flood studies and floodplain modeling, mining, and surveying.

Conclusion

Due to their light weight, small-unmanned aircraft generally pose a significantly lower risk to people and property on the ground, as compared to manned aircraft. The size, weight, speed, and capability of the Inspire 1 UAS will not create a hazard to the users of the NAS or the general public, nor will it pose a threat to national security. Granting this request for exemption would not adversely affect safety, and would be in the public interest.

The UAS will be registered with the FAA, and upon receiving a grant of exemption a "blanket" 200-foot Certificate of Waiver or Authorization (COA) would be requested.

Sincerely,
WOHNRADE CIVIL ENGINEERS, INC.

M. Wohnrade

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Registered Engineer - CO, IL, NV
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