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

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

July 17, 2015

Exemption No. 12078
Regulatory Docket No. FAA–2015–1170

Mr. Michael Intschert
Director of Operations
AUV, LLC
1921 East Flight Line Drive, Building 2
Tucson, AZ 85756

Dear Mr. Intschert:

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 April 14, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of AUV, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct infrastructure inspection in include bridges, building, towers, flare stacks, tunnels, wind turbines, and solar panels.

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 AirRobot AR200, AirRobot AR180, AirRobot AR100, Steadidrone Mavrik, and 3D Robotics Solo.

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 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, AUV, 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.

[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, AUV, 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 AirRobot AR200, AirRobot AR180, AirRobot AR100, Steadidrone Mavrik, and 3D Robotics Solo when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

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

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, DC

Regulatory Docket No. _____

IN THE MATTER OF THE PETITION FOR EXEMPTION OF:
AUV, LLC.
FOR AN EXEMPTION SEEKING RELIEF FROM THE REQUIREMENTS OF
TITLE 14 OF THE CODE OF FEDERAL REGULATIONS
SECTIONS:
CONCERNING COMMERCIAL OPERATION OF THE:
AIRROBOT AR200
AIRROBOT AR180
AIRROBOT AR100
STEADIDRONE MAVRIK
3DR SOLO
PURSUANT TO SECTION 333 OF
THE FAA MODERNIZATION AND REFORM ACT OF 2012 (PUBLIC LAW 112-95)

Submitted on April 14, 2015

AUV, LLC.
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1921 E Flight Line Drive
Building 2
Tucson, Arizona 85756
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APPENDICES

GLOSSARY OF ABBREVIATIONS

AGL	Above Ground Level
AOI	Area of Interest
ATC	Air Traffic Control
ATO	Air Traffic Organization
AV	Aerial Vehicle
C2	Command and Control
C.F.R.	Code of Federal Regulations
COA	Certificate of Authorization
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
GCS	Ground Control Station
GPS	Global Positioning System
LOL	Loss of Link
NAS	National Airspace System
NOTAM	Notice to Airman
PIC	Pilot In Command
Section 333	FAA Modernization and Reform Act of 2012 (FMRA) Section 333
SOP	Standard Operating Procedures
sUAS	Small Unmanned Aircraft System
UA	Unmanned Aircraft
UAS	Unmanned Aircraft System
VFR	Visual Flight Rules
VLOS	Visual Line of Site
VMC	Visual Meteorological Conditions
VO	Visual Observer
VTOL	Vertical Takeoff and Landing

BACKGROUND INFORMATION

AUV, LLC. also known as AUV Flight Services, (hereafter referred to as "AUV") is in the business of consultation and pilot contracting, both for manned and unmanned aircraft operations.

AUV seeks an exemption to operate several sUAS, listed below, for compensation or hire within the National Airspace System ("NAS"). The proposed aircraft all include vertical takeoff and landing (VTOL) Unmanned Aircraft (UA) and transportable Ground Control Stations (GCS). Regulatory exemptions laid out in this petition would allow AUV to provide Infrastructure Inspection to include, but not limited to, bridges, buildings, towers, flare stacks, tunnels, wind turbines, and solar panels.

The sUAS to be operated will be registered in accordance with 49 U.S.C. 44103, Registration of Aircraft, as well as 14 C.F.R Part 47, Aircraft Registration, and marked in accordance with 14 C.F.R. Part 45, Identification and Registration Marking.

AIRCRAFT MODELS INCLUDED IN THIS PETITION

1. SteadiDrone Mavrik
2. AirRobot AR200
3. AirRobot AR180
4. AirRobot AR100
5. 3DR Solo

The 3DR Solo, including the associated manufacturer documentation, has not yet been released. As soon as information is available, AUV will submit amendments and attachments to this petition.

REGULATORY BASIS FOR PETITION

Pursuant to the provisions of the Federal Aviation Regulations (14 C.F.R. § 11.61) and the FAA Modernization and Reform Act of 2012, Section 333, *Special Rules for Certain Unmanned Aircraft Systems*, AUV hereby petitions the Administrator to operate sUAS in the NAS, and for an exemption from the requirements of 14 C.F.R §§ 61.113(a) & (b), 91.7(a), 91.121, 91.151(b), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).

In consideration of the size, weight, speed, and limited operating area associated with the unmanned aircraft and its operation, AUV's operation of the listed UAS meets the conditions of Section 333 and therefore, will not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H.

Accordingly, AUV requests relief from Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b), as these sections set forth requirements for maintenance that only apply to aircraft with an airworthiness certificate.

AUV submits that the requested relief is proper since an equivalent level of safety will be ensured. AUV will perform maintenance, alterations, or preventive maintenance on the UAS as prescribed by the manufacturers' maintenance documentation where applicable, or by returning the aircraft to its manufacturer when operator maintenance is not recommended. Furthermore, AUV will document and maintain all maintenance records for the aircraft used in the requested operations.

Relief from certain requirements of Section 61.113(a) and (b), entitled *Private pilot privileges and limitations: Pilot in command*, is requested by AUV to the extent necessary to allow a Pilot in Command (PIC) holding a private pilot certificate and a third-class airman medical certificate, and who has completed the OEM training and currency requirements, to conduct the proposed UAS operations.. AUV submits that the conditions and limitations set forth herein will ensure the safety of the NAS, as well as the safety of persons or property on the ground.

AUV seeks relief from Section 91.7(a), entitled *Civil aircraft airworthiness*, because the selected sUAS do not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H. As such, AUV submits that it will ensure that the unmanned aircraft are in an airworthy condition prior to every flight, by determining that the UAS are in compliance with the applicable UAS Operator and Maintenance Manuals, and that the UA are in condition for safe flight.

AUV also seeks an exemption from the requirements of Section 91.121, entitled *Altimeter Settings*, as the proposed UAS are equipped with a barometer and Global Positioning System (GPS) equipment, which ensures that a ground level pressure setting will be established prior to each flight. The UA barometer and GPS equipment ensure safety by providing the PIC with

adequate information concerning altitude of the UA, above ground level (AGL), as shown on the heads-up display of the GCS.

Additionally, AUV seeks an exemption from the requirements of Section 91.151(b), *Fuel requirements for flight in VFR conditions*. AUV submits that safety will not be affected because flights will be terminated at or before unsafe battery levels which are recommended by the OEM for safe operation.

In accordance with 14 C.F.R. § 11.81, AUV provides the following information in support of its petition for exemption:

A. Name And Address Of The Petitioner.

The name and address of the Petitioner is:

AUV, LLC.
1921 E Flight Line Drive
Building 2
Tucson, Arizona 85756

The point of contact for this Petition and specific contact information is as follows:

Michael Intschert, Director of Operations
AUV, LLC.
1921 E Flight Line Drive
Building 2
Tucson, Arizona 85756
Phone: (281) 414-0280
Email: Michael.Intschert@auvops.com

B. The Specific Sections of 14 C.F.R. From Which AUV Seeks Exemption.

1. AUV Seeks Exemption From The Requirements Of Section 61.113(a) And (b).

Section 61.113, entitled *Private pilot privileges and limitations*: Pilot in command, subsections (a) and (b) prescribe the following, in part:

> (a) No person who holds a private pilot certificate may act as a pilot in command (PIC) of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as PIC of an aircraft.

(b) A private pilot may, for compensation or hire, act as PIC of an aircraft in connection with any business or employment if—

(1) The flight is only incidental to that business or employment; and

(2) The aircraft does not carry passengers or property for compensation or hire.

2. AUV Seeks Exemption From The Requirements Of Section 91.7(a).

Section 91.7, entitled *Civil aircraft airworthiness*, subsection (a), states the following:

(a) No person may operate a civil aircraft unless it is in an airworthy condition.

3. AUV Seeks Exemption From The Requirements Of Section 91.121.

Section 91.121, entitled *Altimeter settings*, subsection (a), states the following, in relevant part:

(a) Each person operating an aircraft shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to an altimeter that is set, when operating--

(1) Below 18,000 feet MSL, to--

(i) The current reported altimeter setting of a station along the route and within 100 nautical miles of the aircraft;

(ii) If there is no station within the area prescribed in paragraph (a)(1)(i) of this section, the current reported altimeter setting of an appropriate available station; or

(iii) In the case of an aircraft not equipped with a radio, the elevation of the departure airport or an appropriate altimeter setting available before departure;

4. AUV Seeks Exemption From The Requirements Of Section 91.151(b).

Section 91.151, entitled *Fuel requirements* for flight in VFR conditions, subsection (b), states the following:

(b) No person may begin a flight in a rotorcraft 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, to fly after that for at least 20 minutes.

5. AUV Seeks Exemption From The Requirement Of Section 91.405(a).

Section 91.405, entitled *Maintenance required*, subsection (a), states the following:

> Each owner or operator of an aircraft—
>
> (a) Shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in part 43 of this chapter[.]

6. AUV Seeks Exemption From The Requirements Of Section 91.407(a)(1).

Section 91.407, entitled *Operation after maintenance, preventive maintenance, rebuilding, or alteration*, subsection (a)(1), states the following:

> (a) No person may operate any aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless--
>
> (1) It has been approved for return to service by a person authorized under § 43.7 of this chapter[.]

7. AUV Seeks Exemption From The Requirements Of Sections 91.409(a)(1) And 91.409(a)(2).

Section 91.409, entitled *Inspections*, subsection (a), states the following:

> (a) Except as provided in paragraph (c) of this section, no person may operate an aircraft unless, within the preceding 12 calendar months, it has had --
>
> (1) An annual inspection in accordance with part 43 of this chapter and has been approved for return to service by a person authorized by § 43.7 of this chapter; or
>
> (2) An inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.

8. AUV Seeks Exemption From The Requirements Of Sections 91.417(a) And 91.417(b).

Section 91.417, entitled *Maintenance records*, subsections (a) and (b), state the following:

(a) Except for work performed in accordance with §§ 91.411 and 91.413, 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, preventive 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 revision 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.

C. The Extent Of Relief AUV Seeks And The Reason AUV Seeks The Relief.

1. Extent of Relief AUV Seeks And The Reason AUV Seeks Relief From Section 61.113(a) And (b).

Relief from Section 61.113(a) and (b), entitled *Private pilot privileges and limitations: Pilot in command*, is requested to the extent necessary to allow a Pilot in Command (PIC) holding a private pilot certificate and a third-class airman medical certificate, and who has completed the OEM training and currency requirements, to conduct the proposed UAS operations..

This relief is requested since the limitations set forth in Section 61.113(a) and (b) state that a private pilot may, for compensation or hire, act as PIC of an aircraft in connection with any business or employment if (1) The flight is only incidental to that business or employment; and (2) The aircraft does not carry passengers or property for compensation or hire.

As set forth more entirely below, AUV submits that an equivalent level of safety will be maintained because no PIC will be allowed to operate a UAS unless that PIC has demonstrated, through the OEM training and currency requirements, that the PIC is able to safely operate the aircraft in a manner consistent with the operations specifications as

described in this exemption, including evasive and emergency maneuvers, as well as maintaining appropriate distances from people, vessels, vehicles and structures.

Further, AUV submits that all flights of the UAS, conducted by the PIC pursuant to the grant of this Petition (1) will be incidental to AUV's business; and (2) will not carry passengers or property for compensation or hire.

2. Extent of Relief AUV Seeks And The Reason AUV Seeks Relief From Section 91.7(a).

Relief from Section 91.7(a), entitled Civil aircraft airworthiness, is requested to the extent required to allow AUV to determine that the operations UAS is in an airworthy condition prior to every flight by ensuring that the UAS is in compliance with the applicable operations and maintenance manuals, and that the UA is in condition for safe flight. Copies of the manuals, which contain proprietary information, are attached hereto, and are to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

AUV seeks the requested relief because the proposed sUAS do not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H. Therefore, AUV will ensure that the sUAS is in an airworthy condition based upon its compliance with the operating documents prior to every flight, and as stated in the conditions and limitations below.

3. Extent of Relief AUV Seeks And The Reason AUV Seeks Relief From Section 91.121.

Relief from Section 91.121, entitled Altimeter settings, may be required to allow flight operations of the proposed UAS, which utilize barometer and GPS equipment, to ensure that a ground level pressure setting will be established prior to each flight, and in order to report altitude to the PIC. AUV seeks the requested relief because the proposed UAS do not utilize a typical barometric altimeter that may be set as contemplated by Section 91.121. As more fully set forth below, an equivalent level of safety will be maintained since the sUAS are equipped with a barometer and GPS equipment, which will ensure that a ground level pressure setting will be established prior to each flight, and provides the PIC with altitude information of the UA, above ground level (AGL), on the heads-up display of the ground control station (GCS).

4. Extent Of Relief AUV Seeks And The Reason AUV Seeks Relief From Section 91.151(b).

Relief from Section 91.151(b), entitled Fuel Requirements for flight in VFR conditions, is requested to the extent required to allow flights of the battery powered UA, during daylight hours in visual meteorological conditions under visual flight rules (VFR), to continue for a total duration not greater than that recommended by the manufacturer for safe operation. AUV seeks the requested relief, because without an exemption from Section 91.151(b), the flight time duration of the battery powered UA will severely constrain the practicality of any infrastructure inspection flight operations which AUV proposes to conduct pursuant to this Petition.

5. Extent Of Relief AUV Seeks And The Reason AUV Seeks Relief From Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), And 91.417(a) & (b).

Since Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b) only apply to aircraft with an airworthiness certificate, AUV requests relief from these Sections because the sUAS do not require an airworthiness certificate. As set forth more fully below, the selected sUAS meet the conditions of Section 333 of the FMRA for operation without an airworthiness certificate. Accordingly, AUV will perform maintenance, alterations, or preventive maintenance on the UAS as prescribed by the manufacturers' maintenance documentation where applicable, or by returning the aircraft to its manufacturer when operator maintenance is not recommended. Furthermore, AUV will use Kittyhawk.io, a cloud-based electronic maintenance and pilot log, to document and maintain all maintenance records for the aircraft used.

D. Reasons Why Granting AUV's Request Would Be In The Public Interest; That Is, How It Would Benefit The Public As A Whole.

Granting the present Petition will further the public interest by allowing AUV to safely, efficiently, and economically perform infrastructure inspection in the United States, commercially. The use of sUAS for the purpose of infrastructure inspection can greatly reduce the risk to human life in the inspection of dangerous structures as well as increase efficiency to these inspections, allowing for increased inspection of, and in turn, reduced time between inspections of these structures. Additionally, our services will aid in increasing safety and proper operating procedures for these aircraft both in commercial and private markets to reduce risk and

potential accidents. Notably, the benefits of AUV's proposed operations of the listed sUAS will be realized without implicating any privacy issues.

1. The Public Will Benefit From The Infrastructure Inspection.

AUV expects the primary utilizers of the infrastructure inspection covered by this petition to be commercial entities seeking to increase first and foremost, safety, as well as the efficiency of their inspection operations. The program will provide safe, efficient, and economical flight operations. Not many inspection programs like the one outlined in this petition exist, or are as available to the general public. The operators of these aircraft will be properly and thoroughly trained in aircraft systems, safe operations, emergency procedures, and regulations regarding the use of sUAS.

Moreover, AUV's inspection services would reduce barriers to entry for private companies who wish to start using unmanned aircraft. The UAS industry is already expanding at an unbelievable rate, and more companies are exploring the use of this technology every day. AUV will provide a safe and legal way for commercial interests to utilize our inspection programs. The large-scale economic effects of this service will be hugely beneficial to the public as a whole.

2. The Public Will Benefit From Decreased Congestion Of The NAS.

The AirRobot AR100, AR180, AR200, 3DR Solo, and SteadiDrone Mavrik serve as a safe, efficient, and economical alternative to the manned aircraft traditionally utilized in many commercial industries. By reducing the amount of manned aircraft needed, an exemption allowing the use of these aircraft would reduce the amount of manned aircraft in the NAS, reduce noise and air pollution, as well as increase the safety of life and property in the air and on the ground.

Furthermore, by reducing the number of manned aircraft operating in the NAS, congestion around airports caused by arriving and departing aircraft will be reduced. These aircraft do not require an airport to takeoff or land. Likewise, a reduction of manned aircraft conducting commercial operations would result in fewer aircraft that must be handled by air traffic control during the ground, takeoff, departure, arrival, and landing phases of flight operations.

3. The Public Will Benefit From The Safety And Efficiency Of These Aircraft.

Conducting commercial operations with the AirRobot AR100, AirRobot AR180, AirRobot AR200, 3DR Solo, and SteadiDrone Mavrik, instead of manned aircraft, will greatly benefit the public by drastically reducing the levels of air and noise pollution generated during traditional commercial aviation operations. All models use only battery power and electric motors, these aircraft produce no air pollution, and are the most viable environmentally conscious alternative to cabin class, internal combustion aircraft that are typically utilized in commercial operations. sUAS also reduce noise pollution, as the electric motors produce far less noise.

By using these aircraft to perform commercial aerial operations, the substantial risk to life and property in the air and on the ground, which is usually associated with traditional manned aircraft flight operations, will be substantially reduced or completely eliminated. Aside from the lack of flight crew members located onboard the aircraft, these aircraft all weigh less than 55 pounds at their maximum gross weight, and therefore have less physical potential for collateral damage to life and property on the ground, and in the air, compared to typical manned aircraft.

4. There Are No Privacy Issues.

Similar to manned commercial operations that have been conducted for decades, AUV's proposed operations will not implicate any privacy issues. Specifically, these aircraft will be operated only for approved infrastructure inspections and in accordance with all Federal Aviation Regulations, including the minimum altitude requirements of 14 C.F.R. 91.119. Most significantly, these aircraft will not be operated closer than 500 feet to any person, vessel, vehicle, or structure, which is not directly involved in the operations. Privacy and safety of any persons in the vicinity of operations are of great importance to AUV and AUV will comply with all local, state and federal laws applicable to the safety and privacy of people in the vicinity of sUAS operations. Unless required to safely return the aircraft in an emergency situation, aircraft visual sensors will not focus on anything but AUV's assets, or assets AUV has been approved to inspect, and if any images or video of non-AUV assets is accidentally captured, the data will be immediately erased from the UAS camera, sensors, ground stations, etc. at the local landing site.

E. The Reasons Why Granting The Exemption Would Not Adversely Affect Safety, Or How The Exemption Would Provide A Level Of Safety At Least Equal To That Provided By The Rule From Which AUV Seeks Exemption.

1. Reasons Why The AirRobot AR100, AirRobot AR180, AirRobot AR200, 3DR Solo, And SteadiDrone Mavrik UAS Meet The Conditions Of The FAA Modernization and Reform Act of 2012 (FMRA) Section 333.

In consideration of the size, weight, speed, and limited operating area associated with the unmanned aircraft and their operation, AUV's operations of the AirRobot AR100, AirRobot AR180, AirRobot AR200, 3DR Solo, and SteadiDrone Mavrik UAS meet the conditions of FMRA Section 333, and will not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H.

Section 333 provides authority for a UAS to operate without airworthiness certification and sets forth requirements for considering whether a UAS will create a hazard to users of the NAS or the public, or otherwise pose a threat to national security. Specifically, FMRA Section 333 states the following, in part:

> (a) In General.--Notwithstanding any other requirement of this subtitle, and not later than 180 days after the date of enactment of this Act, the Secretary of Transportation shall determine if certain unmanned aircraft systems may operate safely in the national airspace system before completion of the plan and rulemaking required by section 332 of this Act or the guidance required by section 334 of this Act.
>
> (b) Assessment of Unmanned Aircraft Systems.--In making the determination under subsection (a), the Secretary shall determine, at a minimum--
>
> > (1) Which types of unmanned aircraft systems, if any, 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 national airspace system or the public or pose a threat to national security; and
> >
> > (2) Whether a certificate of waiver, certificate of authorization, or airworthiness certification under section 44704 of title 49, United States Code, is required for the operation of unmanned aircraft systems identified under paragraph (1).

(c) Requirements for Safe Operation.--If the Secretary determines under this section that certain unmanned aircraft systems may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft systems in the national airspace system.

In seeking this exemption, AUV submits that the included UAS can operate safely in the NAS pursuant to FMRA Section 333, as demonstrated by: (a) the characteristics of these UAS; (b) the pilot certification requirement; and (c) the specific operating limitations.

A copy of the UA Operator Manuals, which contain proprietary information, are attached hereto as Exhibits A and B, and are to be held in a separate file pursuant to 14 C.F.R. § 11.35(b)1. Other operator's manuals will be submitted as attachments to this petition as they become available to AUV.

A. AirRobot AR100, AR180, And AR200

i. Autonomous Features And Lost Link Procedures

Although a degradation or loss of the control link, and/or degradation or loss of the source of navigation is unlikely, it is a situation that is well planned for and therefore, is a benign event.

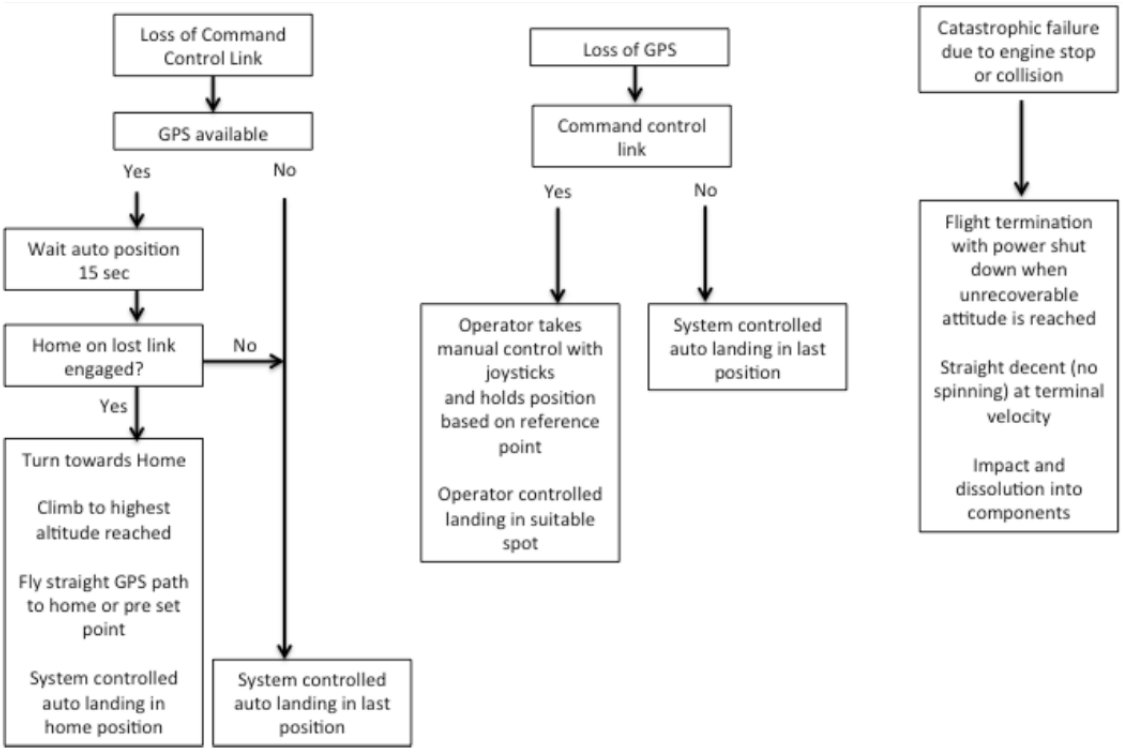
In the event of a lost command and control ("C2") radio link ("lost link"), the aircraft will follow a user-selected procedure. The default procedure with a GPS position lock will wait 20 seconds to reestablish a signal, then climb to highest altitude reached on the aircraft's flight path to its current position, turn towards home (takeoff position or custom position), and fly home. The aircraft will hover at altitude until its battery failsafe initiates an automatic landing. If the lost link event occurs and the aircraft does not have a GPS position lock, the aircraft will immediately initiate an automatic landing at its current position. The aircraft will remain in fully stable and controlled flight throughout all procedures.

If the GPS solution is lost during flight, the pilot will receive an annunciator and will have immediate control of the aircraft.

All AirRobot batteries have built in electronics to monitor temperature, cell balance, and voltage. Any possible battery failure or malfunction can be detected early will result in a either a warning message or automated landing if flight performance could be affected. Takeoff with a malfunctioning battery is impossible.

In case of low battery, failure of individual cells or overheat, unit will initiate a slow (0.5 m/s) auto landing. Low battery alarms and limits are user programmable. The aircraft always preserves sufficient battery power to ensure a safe landing with all sensors and stabilization systems working.

If the aircraft avionics detect a pitch, bank, or roll which exceeds recoverable limits (due to motor failure or another cause) the aircraft will shut down power to all motors, making recovery safe for the operator.



ii. Features Of The AirRobot GCS And Flight Control Software

A complete description of the operation and specifications of the GCS and flight control software for AirRobot UAS is provided in the operator manual of the AR180, attached as Exhibit A. Other operator's manuals will be submitted as attachments to this petition as they become available to AUV.

D. SteadiDrone Mavrik & 3DR Solo

i. Autonomous Features And Lost Link Procedures

When a radio failsafe is triggered one of the following will happen:

- Nothing if the vehicle is already disarmed
- Motors will be immediately disarmed if the vehicle is landed OR in stabilize or acro mode and the pilot's throttle is at zero
- Return-to-Launch (RTL) if the vehicle has a GPS lock and is more than 2 meters from the home position
- LAND if the vehicle has:
  - no GPS lock OR
  - is within 2 meters of home OR
  - the FS_THR_ENABLE parameter is set to "Enabled Always Land"
  - Continue with the mission if the vehicle is in AUTO mode and the FS_THR_ENABLE parameter is set to "Enabled Continue with Mission in Auto Mode".
- If the failsafe clears (i.e. transmitter and receiver regain contact) the copter will remain in its current flight mode. It will not automatically return to the flight mode that was active before the failsafe was triggered. This means that if, for example, the vehicle was in Loiter when the failsafe occured and the flight mode was automatically changed to RTL, even after the transmitter and receiver regained contact, the vehicle would remain in RTL. If the pilot wished to re-take control in Loiter he/she would need to change your flight mode switch to another position and then back to Loiter.

Battery alarms and failsafe's are completely configurable and can trigger based on voltage, amperage, or amp-hours consumed. When a battery failsafe is triggered, one of the following will occur:

- Nothing if the vehicle is already disarmed
- Disarm motors if the vehicle is in Stabilize or Acro mode and the throttle is at zero OR the vehicle is landed
- Return-to-Launch (RTL) if the FS_BATT_ENABLE parameter is set to "2" ("RTL") OR the vehicle is in AUTO mode, has a GPS lock and are at least 2 meters from your home position
- Land in all other cases

The aircraft will remain in fully stable and controlled flight throughout all procedures. All other details on the aircraft's safety procedures and features can be found in the operator's manuals, attached as Exhibit B. Other operator's manuals will be submitted as attachments to this petition as they become available to AUV.

ii. Features Of The GCS And Flight Control Software

A complete description of the operation and specifications of the GCS and flight control software for the SteadiDrone Mavrik UAS is provided in the Operator Manuals, attached as Exhibit B. Other operator's manuals will be submitted as attachments to this petition as they become available to AUV.

2. Flight Operations Of The AirRobot AR100, AirRobot AR180, AirRobot AR200, 3DR Solo, and SteadiDrone Mavrik UAS Are Limited To The Line Of Sight Of A Certificated Pilot in Command With A Safety Observer.

AUV will only utilize pilots who meet the following criteria:

- Possess a valid third class or better FAA airman medical certificate
- Possess and meet currency requirements for at least a sport pilot certificate
- Successful completion of AUV's Multirotor Course

AUV will only utilize visual observers who have achieved a passing grade on the FAA Private Pilot written exam within the past 24 calendar months. Training records, flight time

totals, and applicable flight currency records will all be maintained by AUV. Training Course Outlines for the Multirotor Courses have been attached to this petition as Exhibits F and G. Other Training Course Outlines will be submitted as attachments to this petition as they become available to AUV.

3. Flights Of The AirRobot AR100, AirRobot AR180, AirRobot AR200, 3DR Solo, And SteadiDrone Mavrik UAS Will Be Conducted Pursuant To Specific Operating Limitations.

In seeking this exemption, AUV proposes to commercially operate the specified sUAS for the special purpose of conducting infrastructure inspection in the United States, pursuant to the following specific operating limitations:

1) Operations authorized by the grant of exemption will be limited to the following aircraft described in the operating documents, which are vertical takeoff and landing, unmanned aircraft weighing less than 55 pounds maximum gross weight: AirRobot AR100, AR180, AR200, 3DR Solo, and SteadiDrone Mavrik. Proposed operations of any other aircraft will require a new petition or a petition to amend the grant.
2) These UA may not be flown at an indicated airspeed exceeding 40 miles per hour.
3) These UA must be operated at an altitude of no more than 400 feet above ground level (AGL). All altitudes reported to ATC must be in feet.
4) These UA must be operated within visual line of sight (VLOS) of the Pilot in Command (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.
5) All operations must 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 PIC must be able to communicate verbally at all times. 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 functions prescribed in the operating documents.
6) The operating documents and the grant of exemption must be maintained and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in the exemption and the procedures outlined in the operating

documents, the conditions and limitations in the grant of exemption 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 upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to the grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted the exemption, then the operator must petition for 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.

7) Prior to each flight, the PIC must inspect the UAS to ensure it is in a condition for safe flight. If the inspection reveals a condition that affects the safe operation of the UAS, the UA is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight. The Ground Control Stations must be included in the preflight inspection. All maintenance and alterations must be properly documented in the aircraft records via Kittyhawk.io.
8) Any UAS 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. The PIC who conducts the functional test flight must make an entry in the proper UA record of the flight on Kittyhawk.io.
9) In addition to the pre-flight inspection section in the operating documents, the preflight inspection must also account for all discrepancies, i.e. inoperable components, items, or equipment, not already covered in the relevant sections of the operating documents.
10) The operator must follow the aircraft specific manufacturer's UAS aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements.
11) The operator must carry out its maintenance, inspections, and record keeping requirements, in accordance with the operating documents. Maintenance, inspection, and alterations must be noted in the aircraft logbook on Kittyhawk.io, including total flight hours, description of work accomplished, and the signature of the authorized maintenance personnel or PIC returning the UAS to service.

12) The operator's authorized maintenance personnel or PIC must make a record entry in the UAS logbook or equivalent document of the corrective action taken against discrepancies discovered between inspections.
13) The operator's authorized maintenance personnel, PIC, and VO must receive and document training referenced in the operating documents.
14) The UAS operated under the exemption must comply with all manufacturer System and Safety Bulletins.
15) The PIC must possess at least a FAA-issued sport pilot certificate and a valid FAA-issued third class airman medical certificate. The PIC must also meet the flight review requirements specified in 14 C.F.R. 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.
16) Prior to operating for hire, the PIC, and VO must have successfully completed AUV's training syllabus as outlined in the operating documents. A record of training must be documented and made available upon request by the Administrator. Training, proficiency, and experience-building flights for the purpose of training pilots and VOs to conduct flights authorized by the exemption are permitted under the terms of the exemption.
17) If the UA loses communications or loses its GPS signal, it must return to a pre-determined location within the planned operating area and land, or be recovered in accordance with the operating documents.
18) The PIC must abort the flight in the event of unpredicted obstacles or emergencies in accordance with the operating documents.
19) The operator must obtain an Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA) prior to conducting any operations under the grant of exemption. This COA will also require the operator to request a Notice to Airman (NOTAM) not more than 72 hours in advance, but not less than 48 hours prior to the operation.
20) The UA operated in accordance with the exemption must 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.

21) Before conducting flight operations, the radio frequency spectrum used for operation and control of the UA must comply with the Federal Communications Commission (FCC) or other appropriate government oversight agency requirements.
22) The documents required under 14 C.F.R §§ 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.
23) The UA must remain clear and yield the right of way to all other aircraft operations and activities at all times.
24) UAS operations may not be conducted during night, as defined in 14 C.F.R. § 1.1.
25) All operations must be conducted under visual meteorological conditions (VMC). 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.
26) During operations in the National Airspace System, the UA may not operate within 5 nautical miles of the geographic center of an airport as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airport's management is obtained, and the operation is conducted in accordance with a NOTAM as required by the operator's COA. The letter of agreement with the airport management must be made available to the Administrator upon request.
27) The UA may not be operated over congested or densely populated areas. These areas include, but are not limited to, the yellow areas depicted on World Aeronautical Charts (WAC), Sectional Aeronautical Charts (Sectionals), or Terminal Area Charts (TAC). However, aeronautical charts may not reflect pertinent local information. Ultimately, it is the PIC's responsibility to maintain the minimum safe altitudes required by 14 C.F.R. § 91.119.
28) Operation of the UA must be conducted at least 500 feet from all persons, vessels, vehicles, and structures not directly involved in the operation.
29) Operations of the UA may be conducted at distances less than 500 feet from participating persons, vessels, vehicles or structures that perform an essential function in connection with the special purpose operations. Operations closer than 500 feet from the PIC, VO,

operator trainees and essential persons, are permitted when operationally necessary; but never so close as to present an undue hazard, per 14 C.F.R. § 91.119(a).

30) Operations of the UA may be conducted at distances less than 500 feet from unoccupied vessels, vehicles or structures owned by the land owner/controller when the land owner/controller grants such permission and the PIC makes a safety assessment of the risk from operations closer to these objects.

31) All operations shall be conducted with permission from the land owner/controller or authorized representative. Permission from land owner/controller or authorized representative will be obtained for each flight to be conducted.

32) 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 meeting the requirements of 49 C.F.R. Part 830 must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

4. Reasons Why An Exemption From The Requirements Of Section 61.113(a) And (b) Would Not Adversely Affect Safety.

AUV submits that an equivalent level of safety established by Section 61.113(a) and (b) will be maintained because no PIC will be allowed to operate the UAS unless that PIC has demonstrated, through the proper UAS training and currency requirements, that the PIC is able to safely operate the UAS in a manner consistent with this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from people, vessels, vehicles and structures.

Considering AUV's proposed area of operations and the operating limitations set forth-above; the parallel nature of private pilot aeronautical knowledge requirements to those of commercial pilot requirements (See Exemption No. 11062); and the airmanship skills necessary to safely operate the UAS, AUV submits that the additional manned airmanship experience of a commercially certificated pilot would not correlate to the airmanship skills necessary for AUV's specific proposed flight operations.

Additionally, the FAA has previously granted relief from Section 61.113(a) and (b) specific to UAS, in circumstances similar, in all material respects, to those presented herein (e.g.

Exemption Nos. 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11112, 11136, 11138).

As in Exemption No. 11109, AUV will not allow any PIC to operate the UAS unless that PIC has demonstrated through the UAS training and currency requirements that the PIC is able to safely operate the UAS in a manner consistent with this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from people, vessels, vehicles and structures.

A complete description of the AUV Multirotor training requirements is set forth in the Training Course Outlines, attached as Exhibits F and G. These files contain proprietary information and are to be held in a separate file pursuant to 14 C.F.R. § 11.35(b). Other Training Course Outlines will be submitted as attachments to this petition as they become available to AUV.

5. Reasons Why An Exemption From The Requirements Of Section 91.7(a) Would Not Adversely Affect Safety.

The level of safety established by Section 91.7(a) will be maintained because prior to every flight, AUV will ensure that the UAS is in an airworthy condition and safe for flight based upon the UAS's compliance with its operating documents and as stated in the conditions and limitations herein.

Additionally, the FAA has previously granted relief from Section 91.7(a), specific to UAS, in circumstances similar, in all material respects, to those presented herein (e.g. Exemption Nos. 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11112, 11136, 11138).

6. Reasons Why An Exemption From The Requirements Of Section 91.121 Would Not Adversely Affect Safety.

The equivalent level of safety established by Section 91.121 will be maintained because the UAS is equipped with a digitally encoded barometric altimeter and GPS triangulation equipment, with a zero altitude initiation point being established prior to each flight. As such, the PIC on the UAS is provided the altitude of the UA above ground level (AGL) via a heads-up display of the ground control station (GCS). The FAA has previously granted relief from Section 91.121 specific to UAS, in circumstances similar, in all material respects, to

those presented herein (e.g. Exemption Nos. 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11112, 11136, 11138).

7. Reasons Why An Exemption From The Requirements Of Section 91.151(b) Would Not Adversely Affect Safety.

A grant of this exemption would ensure the equivalent level of safety established by 14 C.F.R. Section 91.151(b) because the operator will always have detailed information on the charge and state of the battery, and preset battery failsafe's will prevent any loss of flight control due to power loss. Furthermore, previous exemptions granted by the FAA concerning Section 91.151(b) establish that safety is not adversely affected when the technical characteristics and operating limitations of a UAS are considered.

The ground control station (GCS) provides a battery indicator on the heads-up display, which indicates the UA's current remaining battery power measured in volts, and thus provides the PIC with constant awareness of the real-time battery voltage during a flight.

Specific details on battery failsafe's can be found in the aircraft Operator's Manuals, attached as Exhibits A and B. Other operator's manuals will be submitted as attachments to this petition as they become available to AUV.

Likewise, as set forth above, AUV has proposed specific operating limitations in this Petition that will maintain the equivalent level of safety established by Section 91.151(b), including the following: (1) the UA will only be operated during daylight hours (i.e. between the end of morning civil twilight and the beginning of evening civil twilight, as published in the American Air Almanac, converted to local time); (2) The UA will only be operated pursuant to visual flight rules (VFR) in visual meteorological conditions (VMC); and (3) the duration of each flight shall not exceed 20 minutes.

Significantly, previous exemptions granted by the FAA concerning Section 91.151 establish that safety is not adversely affected when the technical characteristics and operating limitations of the UAS are considered. Relief has been granted for manned aircraft to operate at less than the minimums prescribed in Section 91.151, including Exemption Nos. 2689, 5745, and 10650. Moreover, the FAA has previously granted relief from Section 91.151, specific to UAS in circumstances similar, in all material respects, to those presented herein

(e.g. Exemption Nos. 8811, 10808, 10673, 11042, 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11136, 11138).

8. Reasons Why An Exemption From The Requirements Of Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), And 91.417(a) & (b) Would Not Adversely Affect Safety.

In seeking this exemption, AUV submits that an equivalent level of safety with regard to the regulatory maintenance and alteration requirements established by Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b) will be met because AUV and the manufacturers of each aircraft, will use trained technicians to perform maintenance, alterations, or preventive maintenance on the unmanned aircraft system using the methods, techniques, and practices prescribed in the manufacturer's maintenance manual. Furthermore, AUV will document and maintain all maintenance records for each of the individual aircraft.

Since each UAS will be inspected as prescribed by the manufacturer's maintenance manual, AUV will maintain the equivalent level of safety established by Sections 91.405(a), 91.409(a)(1), and 91.409(a)(2). The Aircraft Maintenance Manuals set forth Scheduled Maintenance Inspection Procedures for each system and component. Inspection intervals for the aircraft include preflight and postflight inspections, as well as scheduled inspections every 25 hours, 50 hours, 75 hours, and 100 hours of operation.

Likewise, the exemption sought will not adversely affect safety because AUV will perform maintenance, alterations or preventive maintenance on the UAS using the methods, techniques, and practices prescribed by the manufacturer's maintenance manuals for each respective aircraft.

A copy of each aircraft's Operator's Manual, which contain proprietary information, are attached as Exhibits A and B, and are to be held in a separate file pursuant to 14 C.F.R. § 11.35(b). Other operator's manuals will be submitted as attachments to this petition as they become available to AUV.

Furthermore, the exemption sought would maintain an equivalent level of safety established by Sections 91.407, 91.417(a) and 91.417(b) because all maintenance of the aircraft will be performed by manufacturer approved technicians, who will document and maintain maintenance records for the UAS. A Maintenance Action Form must be completed and

saved in the maintenance logs for all maintenance that is performed on the UAS. The procedures for maintaining the maintenance logs for the UAS are fully set forth in the AUV Standard Operating Procedures, Exhibit H. Details on the Kittyhawk.io logging program can be found in the Kittyhawk Sell Sheet, attached as Exhibit C.

Significantly, previous exemptions granted by the FAA concerning Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), 91.417(a) & (b) establish that safety is not adversely affected when the technical characteristics and operating limitations of a UAS are considered. The FAA has previously granted relief specific to UAS in circumstances similar, in all material respects, to those presented herein (e.g. Exemption Nos. 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11112, 11136, 11138).

7. The FAA May Prescribe Any Other Conditions For Safe Operation.

In accordance with Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA) and 14 C.F.R. § 21.16 entitled Special Conditions, AUV requests that the FAA prescribe special conditions for the intended operation of each UAS, which contain such safety standards that the Administrator finds necessary to establish a level of safety equivalent to that established by 14 C.F.R. Part 21, Subpart H, and 14 C.F.R §§ 61.113(a) & (b), 91.7(a), 91.121, 91.151(b), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b). Such special conditions will permit safe operation of the UA for the limited purpose of conducting Infrastructure the United States. FMRA Section 333 sets forth the requirements for considering whether a UAS will create a hazard to users of the NAS or the public, or otherwise pose a threat to national security; and further, provides the authority for such UAS to operate without airworthiness certification in accordance with any requirements that must be established for the safe operation of the UAS in the NAS.

Likewise, the Administrator may prescribe special conditions pursuant to 14 C.F.R. § 21.16, for operation of each UAS, since the airworthiness regulations of 14 C.F.R. Part 21 do not contain adequate or appropriate safety standards, due to the novel or unusual design features of the aircraft. Section 21.16, entitled Special Conditions, states the following:

> *If the FAA finds that the airworthiness regulations of this subchapter do not contain adequate or appropriate safety standards for an aircraft, aircraft engine, or propeller*

because of a novel or unusual design feature of the aircraft, aircraft engine or propeller, he prescribes special conditions and amendments thereto for the product. The special conditions are issued in accordance with Part 11 of this chapter and contain such safety standards for the aircraft, aircraft engine or propeller as the FAA finds necessary to establish a level of safety equivalent to that established in the regulations.

See 14 C.F.R. § 21.16.

Therefore, in accordance with FMRA Section 333 and 14 C.F.R. § 21.16, the FAA may prescribe special conditions for AUV's intended operation of the AirRobot AR100, AR180, AR200, 3DR Solo, and SteadiDrone Mavrik, which contain such safety standards that the Administrator finds necessary to establish a level of safety equivalent to that established by 14 C.F.R. Part 21, Subpart H, and 14 C.F.R Sections 61.113(a) & (b), 91.7(a), 91.121, 91.151(b), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).

F. A Summary That Can Be Published In The *Federal Register*, Stating:

The Rules From Which AUV Seeks Exemption:

AUV, LLC. seeks exemption from the requirements of 14 C.F.R. Sections 61.113(a) & (b), 91.7(a), 91.121, 91.151(b), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).

A Brief Description Of The Nature Of The Exemption AUV Seeks:

This exemption will permit AUV, LLC. to commercially operate Unmanned Aircraft Systems for the purpose of conducting Infrastructure Inspection to include, but not limited to, bridges, buildings, towers, flare stacks, tunnels, wind turbines, and solar panels in the United States.

G. Any Additional Information, Views, Or Arguments Available To Support AUV's Request.

This Petition is made pursuant to the FAA Modernization and Reform Act of 2012 (FMRA) Section 333, which directs the Secretary of Transportation to determine if certain UAS may operate safely in the NAS. As such, AUV's request for exemption may be granted pursuant to the authority of FMRA Section 333 and 14 C.F.R. Part 11, as set forth above.

FMRA Section 333 sets forth the requirements for considering whether a UAS will create a hazard to users of the NAS or the public, or otherwise pose a threat to national security, and further, provides the authority for such UAS to operate without airworthiness certification.

As discussed in detail above, AUV will operate the specified UAS safely in the NAS without creating a hazard to users of the NAS, or the public, or otherwise pose a threat to national security.

CONCLUSION

As set forth herein, AUV seeks an exemption pursuant to 14 C.F.R. § 11.61 and Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA), which will permit safe operation of the AirRobot AR100, AirRobot AR180, AirRobot AR200, 3DR Solo, and SteadiDrone Mavrik UAS commercially, without an airworthiness certificate, for the limited purpose of conducting Infrastructure Inspection within the stated operational guidelines. By granting this Petition, the FAA Administrator will be fulfilling the Congressional mandate of the FAA Modernization and Reform Act of 2012, while also advancing the interests of the public, by allowing AUV to safely, efficiently, and economically operate these UAS commercially within the NAS.

WHEREFORE, in accordance with the Federal Aviation Regulations and the FAA Modernization and Reform Act of 2012, Section 333, AUV respectfully requests that the Administrator grant this Petition for an exemption from the requirements of 14 C.F.R Sections 61.113(a) & (b), 91.7(a), 91.121, 91.151(b), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b), and permit AUV to operate the specified UAS for the purpose of conducting Flight Training and OEM Certification Training over rural areas of the United States.

Dated: April 14, 2015

Respectfully submitted,

AUV, LLC.

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