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

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

August 31, 2015

Exemption No. 12678
Regulatory Docket No. FAA−2015−2486

Mr. Jae H. Ryu
Ryu Engineering and Company, PLLC.
P.O. Box 170842
Boise, ID 83716

Dear Mr. Ryu:

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

By letter dated June 1, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Ryu Engineering and Company, PLLC. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct agricultural applications, such as drought monitoring, pest control, and other crop stress monitoring.

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 Phantom II.

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 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, Ryu Engineering and Company, PLLC. 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, Ryu Engineering and Company, PLLC. is hereafter referred to as the operator.

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

1. Operations authorized by this grant of exemption are limited to the DJI Phantom II 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 September 30, 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:**

**RYU ENGINEERING AND COMPANY, PLLC.**

**FOR AN EXEMPTION SEEKING RELIEF FROM THE REQUIREMENTS OF**

**TITLE 14 OF THE CODE OF FEDERAL REGULATIONS**

**SECTIONS 91.9(b), 91.203(a), 91.203(b), 45.23(b) AND 21.185**

**CONCERNING OPERATION OF AN UNMANNED AIRCRAFT SYSTEM**

**OVER THE STATE OF IDAHO**

**PURSUANT TO SECTION 333 OF THE**

**FAA MODERNIZATION AND REFORM ACT OF 2012**

Submitted on June 1, 2015

Jae H. Ryu
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*Petitioner*

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## GLOSSARY OF ABBREVIATIONS

| | |
|---|---|
| AGL | Above Ground Level |
| ATC | Air Traffic Control |
| COA | Certificate of Authorization |
| FAA | Federal Aviation Administration |
| FAR | Federal Aviation Regulation |
| NAS | National Airspace System |
| Section 333 | FAA Modernization and Reform Act of 2012, Section 333 |
| SMS | Safety Management System |
| UAS | Unmanned Aircraft System |
| VFR | Visual Flight Rules |
| VMC | Visual Meteorological Conditions |

## SUMMARY

Ryu Engineering and Company, PLLC, seeks exemption from the requirements of 14 C.F.R. §§91.9(b), 91.203(a), 91.203(b), 45.23(b) and 21.185 to operate an Unmanned Aircraft System (UAS) pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA). This exemption will permit Ryu Engineering and Company, PLLC, to operate a quadcopter UAS for agricultural applications, such as drought monitoring, pest control, and other crop stress monitoring over areas of the State of Idaho, while keeping the documents required by the regulations at the ground control station and immediately accessible to the pilot in command. Furthermore, the exemption will relieve Ryu Engineering and Company, PLLC, from the airworthiness certificate standards and the requirement to have a certificate of airworthiness issued for its UAS. This exemption will also permit any required markings concerning the operational status of the UAS to be displayed on the fuselage of the unmanned aircraft.

## INTRODUCTION AND INTERESTS OF THE PETITIONER

Ryu Engineering and Company, PLLC. (hereinafter referred to as "REC") is a startup consulting firm providing drought monitoring and map services in the agricultural industries and the water survey. REC has recently acquired a DJI Phantom II Unmanned Aircraft System (hereinafter referred to as the "DJI Phantom II UAS"). As set forth in this Petition, REC seeks to operate its DJI Phantom II UAS for the special purpose of drought monitoring for western agriculture through aerial videography, video documentation, and image production and analysis.

## BACKGROUND

**About DJI Phantom II UAS:** Ryu Engineering and Company (REC) seeks an exemption to operate a DJI Phantom II UAS for agricultural applications, including drought monitoring, pest control, and other crop stress monitoring driven by water shortage, insect outbreak, and nutrient deficiency. The specification of DJI Phantom II UAS includes: 1) an unmanned quad-rotor aircraft and a transportable ground station, 2) a maximum gross weight of approximately 4.4 pounds (2000 grams), while having a diagonal length of 13.7 inches (350mm), 3) equipped with four independent electric motors turning fixed pitch rotors powered by a single Lithium Polymer battery.

**Fig. 1: The DJI Phantom II UAS**

The DJI Phantom II UAS is a common, commercially available, model of remote multi-rotor aircraft. It is currently operating safely within the National Airspace System (NAS) pursuant to Advisory Circular 9157, June 9, 1981. The DJI Phantom family of aircraft has been operating worldwide since 2006.

## BASIS FOR PETITION

Petitioner, Ryu Engineering and Company, PLLC, 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,* hereby petitions the Administrator for an exemption from the requirements of 14 C.F.R. §§ 91.9(b), 91.203(a), 91.203(b), 45.23(b), as well as the restricted category airworthiness certification standards specified in 14 C.F.R. § 21.185, including the requirement to have a certificate of airworthiness as contemplated by 14 C.F.R. Part 21.

In the alternative, and in accordance with Federal Aviation Regulation ("FAR") Section 21.16, entitled *Special Conditions* (14 C.F.R. § 21.16) as follows:

> *"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 14 CFR 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"*

REC respectfully requests that the Administrator prescribe special conditions for the intended operation of the DJI Phantom II UAS that contain such safety standards as the Administrator finds necessary to establish a level of safety equivalent to that established by the restricted category airworthiness certification standards specified in 14 C.F.R. § 21.185. In the alternative, REC seeks an exemption from the requirement to have a certificate of airworthiness

issued for its DJI Phantom II UAS, as otherwise contemplated by 14 C.F.R. Part 21.

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

**A. Name And Address Of The Petitioner.**

The name and mailing address of the Petitioner is:

Ryu Engineering and Company, PLLC
POBOX 170842
Boise, Idaho 83716

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

Jae Ryu
UAS Project Manager
Ryu Engineering and Company, PLLC
POBOX 170842
Boise, Idaho 83716
Tel: (208) 724-0531
Fax: (208) 473-5120
Email: help@ryu-engineering.com

**B. The Specific Sections Of 14 C.F.R. From Which REC Seeks Exemption.**

**1. REC Seeks Exemption From The Requirement Of Section 91.9(b).**

REC seeks an exemption from **14 C.F.R. § 91.9(b).** Section 91.9 entitled *Civil aircraft flight manual, marking, and placard requirements*, subsection (b) states the following:

*(b) No person may operate a U.S.-registered civil aircraft-*

*(1) For which an Airplane or Rotorcraft Flight Manual is required by § 21.5 of this chapter unless there is available in the aircraft a current, approved Airplane or Rotorcraft Flight Manual or the manual provided for in § 121.141(b); and*

*(2) For which an Airplane or Rotorcraft Flight Manual is not required by § 21.5 of this chapter, unless there is available in the aircraft a current approved Airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.*

**2. REC Seeks Exemption From The Requirements Of Sections 91.203(a) and 91.203(b).**

REC seeks an exemption from **14 C.F.R. § 91.203(a) and (b).** Section 91.203 entitled *Civil aircraft: Certifications required*, subsections (a) and (b) state the following:

> *(a) Except as provided in § 91.715, no person may operate a civil aircraft unless it has within it the following:*
>
> *(1) An appropriate and current airworthiness certificate. Each U.S. airworthiness certificate used to comply with this subparagraph (except a special flight permit, a copy of the applicable operations specifications issued under § 21.197(c) of this chapter, appropriate sections of the air carrier manual required by parts 121 and 135 of this chapter containing that portion of the operations specifications issued under § 21.197(c), or an authorization under § 91.611) must have on it the registration number assigned to the aircraft under part 47 of this chapter. However, the airworthiness certificate need not have on it an assigned special identification number before 10 days after that number is first affixed to the aircraft. A revised airworthiness certificate having on it an assigned special identification number, that has been affixed to an aircraft, may only be obtained upon application to an FAA Flight Standards district office.*
>
> *(2) An effective U.S. registration certificate issued to its owner or, for operation within the United States, the second copy of the Aircraft registration Application as provided for in § 47.31(c), or a registration certification issued under the laws of a foreign country.*
>
> *(b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under § 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.*

**3. REC Seeks Exemption From The Requirements Of Section 45.23(b).**

REC seeks an exemption from **14 C.F.R. § 45.23(b)**. Section 45.23 entitled *Display of marks; general*, subsection (b), states the following:

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

**4. REC Requests Relief To Exempt The DJI Phantom II UAS From The Restricted Category Airworthiness Certification Standards Specified In 14 C.F.R.**

**§21.185.**

In accordance with the FAA Modernization and Reform Act of 2012, Section 333, and 14 C.F.R. § 21.16 entitled *Special Conditions*, REC seeks to exempt the DJI Phantom II UAS from the restricted category airworthiness certification specified in **14 C.F.R. § 21.185**, or the requirement to have a certificate of airworthiness issued, as contemplated by **14 C.F.R. Part 21**. Section 21.185 entitled *Issue of airworthiness certificates for restricted category aircraft*, states the following, in part:

> ***(a) Aircraft manufactured under a production certificate or type certificate****. An applicant for the original issue of a restricted category airworthiness certificate for an aircraft type certificated in the restricted category, that was not previously type certificated in any other category, must comply with the appropriate provisions of § 21.183.*

**C. The Extent Of Relief REC Seeks And The Reason REC Seeks The Relief.**

**1. Extent Of Relief REC Seeks And The Reason REC Seeks Relief From Section 91.9(b).**

Relief is requested because the DJI Phantom II UAS weighs approximately 4.4 pounds (2000 grams) at its maximum gross weight and cannot carry the Airplane Flight Manual (See Exhibit A) onboard. Furthermore, since the DJI Phantom II UAS is unmanned, the aircrew member is located at a ground control station. As such, REC proposes the following conditions and limitations to its request for exemption from Section 91.9(b):

> ***The Airplane Flight Manual must be kept at the ground control station, where it is immediately available for reference by the aircrew member (pilot in command) of the DJI Phantom II UAS any time the unmanned aircraft is operating.***
>
> ***The Airplane Flight Manual must be made available within 10 days to any FAA, U.S. Department of Defense, or law enforcement official upon request.***

**2. The Extent Of Relief REC Seeks And The Reason REC Seeks Relief From Section 91.203(a) and (b).**

REC requests relief from the requirement of Section 91.203(a) (*i.e.*, that *an appropriate and current airworthiness certificate and an effective U.S. registration certificate be carried within the aircraft*), and further, requests relief from the requirement of Section 91.203(b) (*i.e.*, that *the airworthiness certificate be displayed at the cabin or cockpit entrance so that it is legible to passengers or crew*). As the DJI Phantom II UAS is unmanned, it has no cabin, cockpit, pilot station, or entrances thereto. Therefore, the aircrew member is located at a ground control station and no passengers are carried at any time. As such, REC proposes the following conditions and limitations to its request for exemption from Sections 91.203(a) and (b):

> ***The documents required by Sections 91.203(a) and (b) must be kept at the ground control station, where it is immediately available to the aircrew member (pilot in command) of the DJI Phantom II UAS any time the unmanned aircraft is operating.***
>
> ***The documents required by 91.203(a) and (b) must be made available within 10 days to any FAA, U.S. Department of Defense, or law enforcement official upon request.***

**3. The Extent of Relief REC Seeks And The Reason REC Seeks Relief From 14 C.F.R. § 45.23(b).**

REC requests relief from the requirement of Section 45.23(b), if applicable, that the word "Restricted" be displayed on the DJI Phantom II UAS near each entrance to the cabin, cockpit, or pilot station. As the DJI Phantom II UAS is unmanned, it has no cabin, cockpit, pilot station, or entrances thereto. REC proposes that, if required, the word "Restricted" be displayed in letters two (2) inches high, horizontally on both sides of the fuselage between the outrunner arms on all sides of the DJI Phantom II UAS.

**4. The Extent Of Relief REC Seeks And The Reason REC Seeks Relief From 14 C.F.R. § 21.185.**

REC seeks relief from the airworthiness certificate requirements of the Federal Aviation Regulations and proposes to commercially operate the DJI Phantom II UAS, without an airworthiness certificate, for the special purpose of conducting aerial videography services over

the State of Idaho. REC seeks relief from the airworthiness certificate requirements of 14 C.F.R. § 21.185 to the extent that the DJI Phantom II UAS, which has not yet been type certificated by the FAA, may be operated as if it were a restricted category aircraft for a single, defined, special purpose operation (*i.e.*, aerial videography for drought monitoring).

Pursuant to the FAA Modernization and Reform Act of 2012, Section 333 ("Section 333"), REC seeks relief from the airworthiness certificate requirements of the FAR because operation of the DJI Phantom II UAS will not create a hazard to users of the NAS, or the public, or otherwise pose a threat to national security.

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

*(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).*

As set forth below, numerous factors, including the proven safe operational history of the DJI Phantom II UAS in the NAS, as well as the specific parameters of REC's intended operation pursuant to this exemption, demonstrate that the DJI Phantom II UAS has in the past, and will continue in the future, to operate safely in the NAS without creating a hazard to other aircraft or people on the ground. Accordingly, the FAA may approve operation of the DJI Phantom II UAS, without an airworthiness

certificate, by setting forth specific operating limitations to ensure a level of safety equivalent to what would be provided by airworthiness certification.

**D. The Reasons Why Granting REC'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 REC to safely, efficiently, and economically perform drought monitoring and image services to mitigate drought impacts over the State of Idaho in support of government entities, water infrastructure entities, and the broad agricultural industry. Additionally, use of the DJI Phantom II UAS will decrease congestion of the NAS, reduce pollution, and provide significant benefits to the regional economy. Notably, the benefits of the proposed operation of the DJI Phantom II UAS will be realized without implicating any privacy issues due to large open spaces in agricultural farmlands.

**1. The Public Will Benefit From Drought Monitoring via Aerial Videography and Image Processes**

REC submits this Petition to perform drought monitoring throughout the State of Idaho, in support of government entities, water infrastructure entities, and the broad agricultural industry. The DJI Phantom II UAS will provide safe, efficient, and economical aerial videography operations and image processes as part of drought monitoring and water management exercises to further each of these fields, all of which are critical to the well-being of the general public in the State of Idaho. Note that the State of Idaho is ranked 1st in the nation for production of potatoes, but water resources is critical to produce much of Idaho's agricultural products, including potatoes, wheat, barley and other grains, and dairies, feedlots, and aquaculture.

Therefore, the specific operations that REC will perform with the DJI Phantom II UAS demonstrate how the requested exemption will directly benefit the above-referenced industries and the public. In water infrastructure industry, the DJI Phantom II UAS will be also used to aid in facility inspections (e.g., dam safety), surveying and planning new worksites along with environmental stewardship, and performing right of way analysis. The DJI Phantom II UAS can carry various cameras for day inspection, can be equipped with additional sensors such as hyperspectral cameras and are programmable to fly specific routes regularly using geocaching. The DJI Phantom II UAS can inspect larger areas, in different ways, in less time and at lower costs. In addition, the more frequent regular inspections facilitate faster problem recognition, resulting in fewer negative externalities. In the broad agricultural industry, the DJI Phantom II UAS will be used to gather video footage not otherwise attainable by traditional means in higher spatial resolutions. The advantage of unmanned systems is that they provide overviews which normally require several cameras, can enter narrow and confined spaces (e.g., closer look for damaged crop field due to insect outbreak) and produce little noise. The DJI Phantom II UAS provides a great alternative to manned aerial vehicle such as helicopters in that they can provide images from similar altitudes, with gyro stabilized cameras and modular platforms at a fraction of the cost. This solution can dramatically increase the applicability, improve the quality and decrease the costs of aerial videography for drought monitoring and other agricultural applications, such as pest control, and crop stress monitoring, thereby maximizing net revenue by minimizing costs in the broad agricultural industry in the United States beyond Idaho.

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

The DJI Phantom II UAS is a battery powered UAS that serves as a safe, efficient, and economical alternative to the manned aircraft traditionally utilized to obtain aerial imagery. By reducing the amount of manned aircraft needed to perform aerial videography, an exemption allowing the use of a DJI Phantom II UAS 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. The DJI Phantom II UAS does not require an airport to takeoff or land. Likewise, a reduction of manned aircraft conducting aerial survey missions would result in fewer aircraft that must be handled by ATC facilities during the ground, takeoff, departure, arrival, and landing phases of flight operations.

**3. The Public Will Benefit From The Safety And Efficiency Of The DJI Phantom II UAS.**

Conducting drought monitoring via aerial videography and image processes with the DJI Phantom II UAS, instead of manned aircraft, will greatly benefit the public by drastically reducing the levels of air and noise pollution generated during traditional aerial videography flight operations. By using battery power and electric motors, the DJI Phantom II UAS produces no air pollution, and is the most viable environmentally conscious alternative to piston or turbine powered rotorcraft. The DJI Phantom II UAS, while reducing the carbon footprint of aerial videography, also eliminates noise pollution as its battery powered electric motors are barely audible during the take-off phase, and cannot be heard when operating more than 100 feet above ground level.

By using the DJI Phantom II UAS to perform aerial videography, 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 aircrew members located onboard the aircraft, the DJI Phantom II UAS (weighing approximately 4.4pounds (2000 grams) at its maximum gross weight with a diagonal length of 13.7 inches (350mm), with no fuel on board), has less physical potential for collateral damage to life and property on the ground, and in the air, compared to the manned aircraft that typically conduct aerial videography (weighing approximately 4,450pounds with a rotor diameter of approximately

34 feet, and a fuel capacity of 110 gallons). The DJI Phantom II UAS has several safety features which will minimize the potential for fly-aways and maximize the safe and efficient use of the aircraft in the NAS. The DJI Phantom II UAS Naza-M-V2 controller provides Intelligent Orientation control (Home Lock and Course Lock features). The Home Lock feature allows for a safe return should the operator (i.e. Pilot in Command) get disoriented as to the direction the aircraft is moving. Once activated on the remote control, the operator can simply pull back on the right control stick and the DJI Phantom II UAS will return to the remote control regardless of the aircraft's location from the remote control. The Course Lock feature will allow the operator to maintain a specific course regardless of aircraft orientation. The Naza-M-V2 controller also provides for fail safe and lost-link safeguards. The fail safe feature means that when the controller link is lost all outputs of the command sticks from the controller will go the center point. An example would be if the aircraft is in a climbing right turn and the communication link is lost, the aircraft would go into a level hover and not continue with the last assigned controller instructions. After 3 seconds of the lost-link scenario, the aircraft will climb or descent (based on altitude the lost-link occurs) to a pre-assigned altitude and return to the point of departure and land itself. A more detailed description of each system is attached as Exhibit B.

**4. Performing Drought Monitoring With The DJI Phantom II UAS Will Benefit The Economy.**

In addition to being safe and efficient, the DJI Phantom II UAS is also an economical alternative to using manned aircraft to conduct drought monitoring via aerial videography and image processes. As such, operation of the DJI Phantom II UAS will allow United States based companies, like REC, to remain competitive and contribute to growth of the U.S. economy.

Specifically, with the rising cost of aviation fuel and the Environmental Protection Agency ("EPA") regulatory actions phasing out leaded fuels, U.S. owned and operated companies must adopt new and alternative technology in order to remain competitive.

Operating the battery powered DJI Phantom II UAS is one such technology that not only allows companies greater operational flexibility compared to manned aircraft, but provides such flexibility without the high operational cost of a traditional manned aircraft.

By operating the DJI Phantom II UAS, companies such as REC can remain competitive and profitable, and therefore provide greater job stability to employees and contractors, which will ultimately contribute to growth of the U.S. economy. Improved financial performance of U.S. companies, through commercial use of the DJI Phantom II UAS, provides a stable workforce that increases consumer spending; improves local, state, and federal tax revenues; and allows companies to invest in research and development in order to remain competitive both in the United States and abroad.

**5. There Are No Privacy Issues.**

Like the manned aerial videography flight operations that have been conducted for decades, the proposed operation of the DJI Phantom II UAS will not implicate any privacy issues. Specifically, the DJI Phantom II UAS will be operated over the public right-of-way or above private property with the property owner/controllers consent, and in accordance with all Federal Aviation Regulations.

## 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 REC Seeks Exemption.

### 1. Reasons Why An Exemption From The Requirements Of Section 91.9(b) Would Not Adversely Affect Safety.

This exemption would maintain the level of safety established by Section 91.9(b) because REC will keep the Airplane Flight Manual (See Exhibit A) at the ground control station where the pilot in command flying the DJI Phantom II UAS will have immediate access to the document.

Safety will not adversely affected when the Aircraft Flight Manual is kept at the ground control station of a UAS, where it can be immediately accessed by the pilot in command. Section 91.9(b) "*requires aircraft to carry the flight manual so the pilot would have ready access to the aircraft limitations while in flight*." However, the FAA has found that UAS will always be operated without any passengers or crew onboard by definition of UAS.

, and that "requiring these special-use aircraft [UAS] to carry superfluous paper documents may present a safety hazard to the integrity of the [UAS]." *Id.*

The FAA has previously granted exemptions in circumstances similar, in all material respects, to those recently presented herein (*e.g.*, Exemption Nos. 10167, 10602, 10673, 10835, 10869, 10968).

**2. Reasons Why An Exemption From The Requirements Of Section 91.203(a) And (b) Would Not Adversely Affect Safety.**

This exemption would maintain the level of safety established by Sections 91.203(a) and (b) because REC will keep the required documents at the ground control station where the pilot in command flying the DJI Phantom II UAS will have immediate access.

Note that the FAA has previously granted exemptions in circumstances similar, in all material respects, to those presented herein (*e.g.*, Exemption Nos. 8607, 8737, 8738, 9299, 9564, 9565, 10167, 10602, 10673, 10835, 10869, 10968).

**3. Reasons Why An Exemption From The Requirements Of 14 C.F.R. § 45.23(b) Would Not Adversely Affect Safety.**

This exemption would maintain the level of safety established by Section 45.23(b) because if required, displaying the word “Restricted” with two (2) inch high letters, horizontally between outrunners on all four sides of the DJI Phantom II UAS, will inform all parties of the unmanned aircraft’s overall operating status.

Significantly, REC will display the word “Restricted” in two (2) inch high letters in compliance with size requirement of Section 45.23(b) (*i.e.*, “letters not less than 2 inches nor more than 6 inches high”). By placing the letters horizontally between outrunners on all four sides of the DJI Phantom II UAS, will ensure that the word “Restricted” is the in most visible location, so that all parties will be informed of the unmanned aircraft’s overall operating status.

The FAA has previously granted exemptions in circumstances similar, in all material respects, to those presented herein (*e.g.*, Exemption Nos. 8737, 10167, 10167A, 10700, 10810).

**4. Reasons Why An Exemption From The Requirements Of 14 C.F.R. § 21.185, Including The Requirement To Have A Certificate Of Airworthiness, Would Not Adversely Affect Safety.**

In seeking this exemption, REC submits that the DJI Phantom II UAS can operate safely in the NAS above the State of Idaho without creating a hazard to other aircraft or people on the ground. Accordingly, the FAA may approve its use without an airworthiness certificate as demonstrated by: (i) the safe operational history and current use of the DJI Phantom II UAS in the NAS; (ii) the characteristics of the DJI Phantom II UAS; (iii) the limited area of REC’s intended operation; (iv) the Safety Management System REC has developed for DJI Phantom II UAS operations and maintenance; (v) the appropriate airman certificate; (vi) the specific operating limitations; and (vii) any other conditions that the Administrator may prescribe.

**i. The DJI Phantom II UAS Has A Proven History Of Operation In The NAS Pursuant To Advisory Circular 91-57, June 9, 1981.**

The DJI Phantom II UAS is currently operating safely in the NAS pursuant to Advisory Circular 91-57, *Model Aircraft Operating Standards*. The DJI Phantom II UAS has been operated worldwide since 2006.

**ii. The Specifications Of The DJI Phantom II UAS Demonstrate Its Safe Characteristics.**

The DJI Phantom II UAS does not create a hazard to users of the NAS or the public, or otherwise pose a threat to national security considering its size, weight, speed, or operational capability. The specifications of the DJI Phantom II UAS are as follows:

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|---|---|
| Unmanned Aircraft System | The DJI Phantom II is an Unmanned Aircraft System that is comprised of an unmanned quad-rotor aircraft and a transportable ground station. |
| Unmanned Aircraft Dimensions | Diagonal Length:<br>13.7 inches (350mm) |
| Engine (Propulsive Unit) | <u>Engine (Propulsive Unit)</u><br><br>(4) Multistar P/N : 2212 (Electric) FAA<br>Engine Type Cert: None<br>Propulsive Unit Type: (1) 11.1V 5200mAh, Lithium polymer battery powered, brushless electric motors<br><br><u>Motor, Controller Sub-Assembly:</u><br>Manufacturer: DJI Innovations<br>Model: Naza-M<br>Type: Motor Controller<br>3.15W (0.25A@12.6V) Maximum<br>27 grams Wt.<br><br><u>Motor, Battery:</u><br>Manufacturer: DJI Innovations<br>Type: 3S Lithium Polymer<br>5200 milliamp hour<br>11.1V (nominal) |

| | |
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| Fuel | Not Applicable.<br>NOTE: The DJI Phantom II UAS is powered by a Lithium Polymer rechargeable battery, DJI, Inc. P/N 733496-5200mAh-11.1V. |
| Engine (Propulsive Unit) Limits | Maximum Power Output: 130 Watts<br>Maximum RPM: 920Kv (rpm/v) |
| Propeller and Propeller Limits | (4) DJI Innovations<br>FAA Propeller Type Certificate: None<br>Propeller Type: 2-blade, ABS plastic, fixed pitch<br><br><u>Propeller Sub-Assembly:</u><br>Manufacturer: DJI Innovations<br>Model: 9450 10x4.5mm<br>Diameter (Nominal): 10 in. |
| Battery Command & Control | DJI Innovations battery powers the motor, and internal battery powers the command and control ground station (remote). |
| Airspeed Limits | Vne (Never Exceed Speed) 29 knot (15 m/s)<br>Vno (Maximum Structural Cruising Speed) Not Applicable<br>Va (Maneuvering Speed) Not Applicable<br>Landing Speed: Not Applicable |
| Mean Aerodynamic Chord (MAC) | Not Applicable |
| Leveling Means | Not Applicable. |
| Maximum Weights | Ramp 4.4 lbs (2000 grams)<br>Takeoff 4.4 lbs (2000 grams)<br>Landing 4.4 lbs (2000 grams) |
| Empty Weight | 2.2 lbs. (1000 grams)<br><br>NOTE: Empty Weight Includes weight of battery and Excludes payload modules. |
| Frequencies | 902-928 MHz (ISM Band)<br>2.4 GHz (ISM Band)<br><br>NOTE: FCC license is not required to utilize the above frequencies; uplink and downlink are on the 900Mhz band.<br>If<br>video is utilized, |

| | |
|---|---|
| Computer Software | Ground Station software, iOS |
| Minimum Crew | (1) The DJI Phantom II UAS can be operated by a single operator. |
| Number of Seats | (0) Not Applicable. |
| Fuel Capacity | Not Applicable. |
| Oil Capacity | Not Applicable |
| Max. Operating Altitude | 393 ft. AGL (120 M) |
| Control Surface Movements | Not Applicable |
| Nominal Endurance | 25 minutes 14° - 122° F (-20° - 50° C) |
| Ambient Outside Air Temperature (OAT) | Maximum OAT: 122° F (50° C)<br>Minimum OAT At Altitude: 14° F (-10° C) |
| Wind Limitation | Not Applicable |
| Maintenance | This DJI Phantom II UAS must be maintained in accordance with the DJI Phantom II Maintenance Operation Manual, or later FAA accepted revision. |

**iii. Flight Operations Pursuant To The Exemption Sought Would Be Limited To Areas Over The State Of Idaho That Is Not In The Proximity Of Airports Or Over Populated Areas.**

REC proposes to only conduct drought monitoring via aerial videography flight operations along with image processes over areas of the State of Idaho that are not near populated areas, airports, helipads, or state roads. Specifically, REC's proposed area of flight operations over the State of Idaho includes areas that are:

1. Not within five (5) miles of any airport or helipad, without the consent of the

affected ATC facility. Continuous two-way radio communication will be established and maintained at all times during flights in this area;

2. Not below one hundred fifty (150) feet over of state roads having more than two lanes; and

3. Not below seventy-five (75) feet over state roads having two lanes or less. Since this platform is capable of hovering, slewing laterally, and ascending/descending over a point, we are considering the DJI Phantom II UAS a "helicopter" for the purposes of 91.119(d). Furthermore, all flight operations will be conducted in accordance with 14 C.F.R. § 91.119. *Minimum safe altitudes: General*.

In summary, REC seeks to operate its DJI Phantom II UAS over areas of Idaho, while maintaining safe distances from any populated areas, airports, helipads, and roadways.

**iv. Operation Of The DJI Phantom II UAS Will Be Conducted Pursuant To A Safety Management System.**

A Safety Management System ("SMS") will control REC's operation of the DJI Phantom II UAS and will significantly contribute to maintaining the level of safety contemplated by the airworthiness certificate requirements from which REC now seeks relief.

Pursuant to the SMS and 14 C.F.R. § 43.13, entitled *Performance Rules (general)*, each person performing maintenance, alteration, or preventive maintenance on the DJI Phantom II UAS, motor, propeller, or appliance shall use the methods, techniques, and practices prescribed in the current manufacturer's maintenance manual or Instructions for Continued Airworthiness prepared by its manufacturer, or other methods, techniques, and practices acceptable to the Administrator. Each person shall use the tools, equipment, and test apparatus necessary to assure completion of the work in accordance with accepted industry practices.

**v. Flight Operations Of The DJI Phantom II UAS Are Limited To The Line Of Sight Of An Appropriate Airman Certificated Pilot in Command With A Safety Observer.**

REC will only utilize Private Pilots with a valid First or Second Class Airman Medical certificate to act as pilot in command of the DJI Phantom II UAS. Additionally, all pilots will be assisted by a safety observer. The pilot in command and safety observer must meet the requirements as set forth by the SMS/Standard Operating Procedures (See Exhibit C) adopted by REC for flight operations of the DJI Phantom II UAS. A copy of the Standard Operating Procedures, which is proprietary information, is attached hereto as Exhibit C revised after Hershey Volunteer Fire Company.

**vi. Flights Will Be Conducted Pursuant To Specific Operating Limitations.**

In seeking this exemption, REC proposes to commercially operate the DJI Phantom II UAS without satisfying the restricted category airworthiness certification process specified in 14 C.F.R. § 21.185, or otherwise having a certificate of airworthiness issued by the FAA, as contemplated by 14 C.F.R. Part 21. REC proposes to operate the DJI Phantom II UAS, for the special purpose of conducting drought monitoring via aerial videography and image processes over the State of Idaho, pursuant to the following specific operating limitations:

1. Flight operations are permitted only over the State of Idaho.
2. The DJI Phantom II UAS will be operated at or below 400 ft. above ground level (AGL), except as necessary to comply with the requirements of 14 C.F.R. § 91.119.
3. The DJI Phantom II UAS shall be operated within one mile, and within line of sight, of the pilot in command and safety observer.
4. The DJI Phantom II UAS shall be operated pursuant to Day Visual Flight Rules (VFR) in visual meteorological conditions (VMC). The DJI Phantom II UAS shall be operated only 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). The duration of each flight shall not exceed 25 minutes or upon reaching 25% battery power, whichever is less.

5. The DJI Phantom II UAS shall operate from on-site takeoff/landing locations directly next to the pilot in command and co-located safety observer. If the operation is from a watercraft, the pilot in command and safety observer shall remain co-located on the same watercraft.
6. Operations shall be conducted by certificated airmen who have completed training, checking, currency, and recency of experience requirements as approved by the FAA Administrator.
7. Operation of the DJI Phantom II UAS with any inoperative instruments or equipment shall be prohibited.
8. The DJI Phantom II UAS shall be maintained in accordance with the Manufacturer's Maintenance Manual.
9. The DJI Phantom II UAS shall be operated pursuant to 14 C.F.R. Part 91, operating requirements.
10. For the proposed flight operation, only one DJI Phantom II UAS shall be airborne at any given time.
11. Prior to flight operations, REC shall coordinate and establish two way communications with an Air Traffic Control facility nearby, if any.
12. For any flight operations over U.S. Government or state managed lands, REC shall coordinate with the appropriate authority and ensure that the property owners have at least twelve (12) hours of advance notice prior to the proposed flight operations. Coordination shall include anticipated periods of operation, purpose of the flights, and contact information for the operator should questions or issues arise.

**vii. Any Other Conditions The FAA May Prescribe For Safe Operation.**

In accordance with Section 333 of the FAA Modernization and Reform Act of 2012 and 14 C.F.R. § 21.16 entitled *Special Conditions*, REC requests that the FAA prescribe special conditions for the intended operation of the DJI Phantom II UAS, which contain such safety standards that the Administrator finds necessary to establish a level of safety equivalent to that established by Section 21.185, and which will permit safe operation of the DJI Phantom II UAS for the special purpose of conducting drought monitoring via aerial videography and image processes over the State of Idaho. 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 aircraft systems in the NAS.

Likewise, the Administrator may prescribe special conditions pursuant to 14 C.F.R. § 21.16, for operation of the DJI Phantom II 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 (*See* 14 C.F.R. § 21.16 for details):

> *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.*

Therefore, in accordance with Section 333 and 14 C.F.R. § 21.16, the FAA may prescribe special conditions for REC's intended operation of the DJI Phantom II UAS, which contain such safety standards that the Administrator finds necessary to establish a level of safety equivalent to

that established by Section 21.185, and which will permit safe operation of the DJI Phantom II UAS for the special purpose of conducting drought monitoring via aerial videography and image processes over the State of Idaho.

**F. A Summary That Can Be Published In The *Federal Register,* stating: The Rules From Which REC Seeks Exemption:**

*Ryu Engineering and Company, PLLC. seeks exemption from the requirements of 14 C.F.R. §§ 91.9(b), 91.203(a), 91.203(b), 45.23(b) and 21.185.*

**A Brief Description Of The Nature Of The Exemption REC Seeks:**

***This exemption will permit Ryu Engineering and Company (REC), PLLC. to operate an Unmanned Aircraft System over certain rural areas of the State of Idaho, while keeping the documents required by the regulations at the ground control station and immediately accessible to the pilot in command. Furthermore, the exemption will relieve REC, PLLC. from the airworthiness certificate standards and the requirement to have a certificate of airworthiness for its Unmanned Aircraft System. This exemption will also permit any required markings concerning the operational status of the UAS to be displayed on the fuselage of the unmanned aircraft.***

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

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

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

> *(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.*

As discussed in detail above, the DJI Phantom II UAS has in the past, and will continue in the future, to operate 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 above, REC seeks an exemption pursuant to 14 C.F.R. § 11.61 and Section 333 of the FAA Modernization and Reform Act of 2012, which will permit safe operation of the DJI Phantom II UAS commercially, without an airworthiness certificate, for the special purpose of conducting drought monitoring via aerial videography and image processes over areas in the State of Idaho. 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 REC to safely, efficiently, and economically operate the DJI Phantom II UAS commercially within the NAS.

**WHEREFORE**, in accordance with the Federal Aviation Regulations and the FAA Modernization and Reform Act of 2012, Section 333, REC respectfully requests that the Administrator grant this Petition for an exemption from the requirements of 14 C.F.R. §§ 91.9(b), 91.203(a), 91.203(b), 45.23(b), as well as the restricted category airworthiness certification standards specified in 14 C.F.R. § 21.185, including the requirement to have a certificate of airworthiness issued for the DJI Phantom II UAS, as contemplated by 14 C.F.R. Part 21.

Dated:

June 1, 2015

Respectfully submitted,

**Ryu Engineering and Company, PLLC.**

*/s/ Jae H. Ryu*

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