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

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

April 20, 2015

Exemption No. 11394
Regulatory Docket No. FAA–2015–0160

Mr. Craig E. Bryan
Chief Pilot
Cirrus Exploration Company
3423 South Soncy Road, Suite 200
Amarillo, TX 79119

Dear Mr. Bryan:

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

The Basis for Our Decision

By letter posted January 23, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Cirrus Exploration Company (hereinafter petitioner or operator) for an exemption. The exemption would allow the petitioner to operate an unmanned aircraft system (UAS) to conduct flight instruction, commercial aerial work flight operations, student instruction, aerial photography and survey, and power line or pipeline patrol.

See Appendix A for the petition submitted to the FAA describing the proposed operations and the regulations that the petitioner seeks an exemption.

The FAA has determined that good cause exists for not publishing a summary of the petition in the Federal Register because the requested exemption would not set a precedent, and any delay in acting on this petition would be detrimental to the petitioner.

Airworthiness Certification

The UAS proposed by the petitioner are the DJI Phantom 2 Vision+ and a DJI Inspire 1.

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. 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, Cirrus Exploration Company is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption, Cirrus Exploration Company 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 2 Vision+ and DJI Inspire 1 when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

2. Operations for the purpose of closed-set motion picture and television filming are not permitted.

3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.

4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude must be reported in feet AGL.

5. The UA must be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate or U.S. driver's license.

6. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. The VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and

limitations in this exemption and the procedures outlined in the operating documents, the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS−80) may be contacted if questions arise regarding updates or revisions to the operating documents.

8. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g. replacement of a flight critical component, must undergo a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.

9. The operator is responsible for maintaining and inspecting the UAS to ensure that it is in a condition for safe operation.

10. Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, e.g. inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.

11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.

12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.

13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Colombia, 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 April 30, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Petition for Exemption
(Pursuant to 14 CFR Section 11.81)

Identification of Petitioner

This petition for exemption is submitted on behalf of **Cirrus Exploration Company** including its chief pilot, **Craig E Bryan** (collectively referred to as "Cirrus"), **3423 S Soncy Road, Suite 200, Amarillo, Texas 79119-4972, (via email at cbryan@cirrushelicopter.com).**

Petition Based Upon Prior Exemption

This petition is based, in part, upon prior exemption granted pursuant to *In the matter of Douglas Trudeau, Realtor (Regulatory Docket No. FAA-2014-0481, Exemption issued January 5, 2015).*

Request for Exemption

Cirrus respectfully requests relief from the following regulations for the purpose of conducting flight instruction and commercial "aerial work" flight operations (as defined by 14 CFR Section 119.1(e)(1) Student instruction, Section 119.1(e)(4)(iii) Aerial photography or survey, and Section 119.1(e)(4)(vi) Powerline or pipeline patrol) utilizing DJI Phantom 2 Vision + and DJI Inspire 1 Unmanned Aerial Systems ("UAS"):

Part 21 prescribing the procedural requirements for issuing and changing design approvals, productions approvals, airworthiness certificates, and airworthiness approvals. *(Cirrus believes relief from this section is not necessary under the statutory criteria provided in Section 333 of Public Law 112-95 [P.L. 112-95] in reference to 49 USC Section 44794 given the size, weight, speed, and limited operating area associated with the proposed UAS)*

Section 45.23(b) prescribing that 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. *(Cirrus believes relief from this section is not necessary as the proposed UAS is not certificated under Section 21.191 and this petition is submitted in connection with proposed operations as a Civil UAS)*

Section 61.31(a) prescribing that a person who acts as a pilot in command of any of the following aircraft must hold a type rating for that aircraft for other aircraft specified by the Administrator through aircraft type certificate procedures:

(1) Large aircraft (except lighter-than-air).

(2) Turbojet-powered airplanes.

(3) Other aircraft specified by the Administrator through aircraft type certificate procedures.

(Cirrus believes relief from this section is not necessary under the statutory criteria provided in Section 333 of P.L. 112-95 in reference to 49 USC Section 44794 given the size, weight, speed, and limited operating area associated with the proposed UAS)

Section 61.31(c) prescribing that unless a person holds a category, class, and type rating (if a class and type rating is required) that applies to the aircraft, that person may not act as pilot in command of an aircraft that is carrying another person, or is operated for compensation or hire. That person also may not act as pilot in command of that aircraft for compensation or hire. *(Cirrus believes relief from this section is not necessary under the statutory criteria provided in Section 333 of P.L. 112-95 in reference to 49 USC Section 44794 given the size, weight, speed, and limited operating area associated with the proposed UAS)*

Section 61.31(d) prescribing that to serve as the pilot in command of an aircraft, a person must—

(1) Hold the appropriate category, class, and type rating (if a class or type rating is required) for the aircraft to be flown; or

(2) Have received training required by this part that is appropriate to the pilot certification level, aircraft category, class, and type rating (if a class or type rating is required) for the aircraft to be flown, and have received an endorsement for solo flight in that aircraft from an authorized instructor.

(Cirrus believes relief from this section is not necessary under the statutory criteria provided in Section 333 of P.L. 112-95 in reference to 49 USC Section 44794 given the size, weight, speed, and limited operating area associated with the proposed UAS or, alternatively, requests relief from this section by Pilot in Command (PIC) compliance with the applicable operational documents published by the manufacturer and the Proposed Conditions and Limitations set forth in this petition)

Section 91.7(a) prescribing that no person may operate a civil aircraft unless it is in an airworthy condition. *(Cirrus requests relief from this section by Pilot in Command (PIC) compliance with the applicable operational documents published by the manufacturer and the Proposed Conditions and Limitations set forth in this petition)*

Section 91.7(b) prescribing that the pilot in command of a civil aircraft is responsible for determining whether that aircraft is in condition for safe flight and that the PIC shall discontinue the flight when unairworthy mechanical, electrical, or structural conditions occur. *(Cirrus requests relief from this section by Pilot in Command (PIC) compliance with the applicable operational documents published by the manufacturer and the Proposed Conditions and Limitations set forth in this petition)*

Section 91.9(b)(2) prohibits operation of U.S.-registered civil aircraft unless there is available in the aircraft a current approved Airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof. *(Cirrus believes relief from this section is not necessary as the FAA has previously determined relief is not required provided the relevant materials published by the manufacturer are kept in a location accessible to the PIC in compliance with the regulations)*

Section 91.103(b) prescribing that a pilot shall for any flight, become familiar with runway lengths at airports of intended use, and takeoff and landing distance information. *(Cirrus believes relief from this section is not necessary provided the PIC complies with the Proposed Conditions and Limitations set forth in this petition)*

Section 91.109(a) prescribing, in pertinent part, that no person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls. *(Cirrus believes relief from this section is not necessary provided the PIC complies with the Proposed Conditions and Limitations set forth in this petition or utilizes the DJI Inspire 1 UAS dual control feature)*

Section 91.119 prescribing that, except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface. *(Cirrus believes relief from this section is not necessary provided the Pilot in Command (PIC) complies with the applicable operational documents published by the manufacturer and the Proposed Conditions and Limitations set forth in this petition)*

(b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft. *(Cirrus believes relief from this section is not necessary provided the Pilot in Command (PIC) complies with the applicable operational documents published by the manufacturer and the Proposed Conditions and Limitations set forth in this petition)*

(c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure. *(Cirrus requests relief from this section by Pilot in Command (PIC) compliance with the applicable operational documents published by the manufacturer and the Proposed Conditions and Limitations set forth in this petition)*

Section 91.121 requires, in pertinent part, each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "...to the elevation of the departure airport or an appropriate altimeter setting available before departure." *(Cirrus believes relief from this section is not necessary provided the PIC complies with the Proposed Conditions and Limitations set forth in this petition)*

Section 91.151(a) prescribing that no person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, (1) during the day, to fly after that for at least 30 minutes [emphasis added]. *(Cirrus requests relief from this section by Pilot in Command (PIC) compliance with the applicable operational documents published by the manufacturer and the Proposed Conditions and Limitations set forth in this petition)*

Section 91.203(a) prohibits, in pertinent part, any person from operating a civil aircraft unless it has within it (1) an appropriate and current airworthiness certificate; and (2) an effective U.S. registration certificate issued to its owner or, for operation within the United States, the second copy of the Aircraft registration Application as provided for in § 47.31(c). *(Cirrus believes relief from this section is not*

necessary as the FAA has previously determined relief is not required provided the relevant materials published by the manufacturer and the Proposed Conditions and Limitations are kept in a location accessible to the PIC in compliance with the regulations)

Section 91.203(b) prescribing, in pertinent part, that no person may operate a civil aircraft unless the airworthiness certificate 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. *(Cirrus believes relief from this section is not necessary as the FAA has previously determined relief is not required provided the relevant materials published by the manufacturer and the Proposed Conditions and Limitations are kept in a location accessible to the PIC in compliance with the regulations)*

Section 91.405(a) requires, in pertinent part, that an aircraft operator or owner shall have that aircraft inspected as prescribed in subpart E of the same part and shall, between required inspections, except as provided in paragraph (c) of the same section, have discrepancies repaired as prescribed in part 43 of the chapter. *(Cirrus requests relief from this section by Pilot in Command (PIC) compliance with the applicable operational documents published by the manufacturer and the Proposed Conditions and Limitations set forth in this petition)*

Section 91.407(a)(1) prohibits, in pertinent part, any person from operating an aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless it has been approved for return to service by a person authorized under § 43.7 of the same chapter. *(Cirrus requests relief from this section by Pilot in Command (PIC) compliance with the applicable operational documents published by the manufacturer and the Proposed Conditions and Limitations set forth in this petition)*

Section 91.409(a) prescribing that 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) that no person may operate an aircraft unless, within the preceding 12 calendar months, it has had an inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter. *(Cirrus requests relief from this section by Pilot in Command (PIC) compliance with the applicable operational documents published by the manufacturer and the Proposed Conditions and Limitations set forth in this petition)*

Section 91.417(a) and (b) prescribing, in pertinent part, that—

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

(1) Records of the maintenance, 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.

(Cirrus requests relief from this section by Pilot in Command (PIC) compliance with the applicable operational documents published by the manufacturer and the Proposed Conditions and Limitations set forth in this petition)

Extent of and Reasons for Relief Sought

Cirrus intends to operate two commercially available UAS types (DJI Phantom 2 Vision + and DJI Inspire 1) for the purpose of providing flight demonstration and instruction and aerial work under the provisions of 14 CFR Section 119.1 (e)(1) Student instruction, Section 119.1 (e)(4)(iii) Aerial photography or survey, and Section 119.1 (e)(4)(vi) Powerline or pipeline patrol. Cirrus currently holds Air Carrier Certificate 3CXA478M effective May 10, 2011 operating both fixed-wing and rotorcraft (helicopter) aircraft. Cirrus intends to offer commercial "aerial work" services utilizing UAS under the exemptions to 14 CFR Section 135 granted under 14 CFR 119.1(e) as set forth above. Additionally, Cirrus chief pilot, Craig E Bryan, holds a Commercial Pilot Certificate No. 3226654 (Airplane Single & Multiengine Land, Instrument Airplane, Rotorcraft-Helicopter, and Glider along with Flight Instructor Certificate No. 3226654CFI (Airplane Single & Multiengine and Glider).

Public Interest and Benefit

The above "aerial work" services, normally provided in manned aircraft, may be provided with increased safety and at significantly lower cost in situations where the use of unmanned UAS aircraft would supplement or replace the use of manned aircraft as a result of safety or economic considerations in certain applications where extended operational range and limited time aloft are not a factor. The proposed UAS operations will pose no threat to the public given its small size and lack of combustible fuel when compared to larger manned aircraft, minimize potential ecological affects or damage, and promote economic growth by providing data information to individuals or companies requiring aerial survey or imaging data. Additionally, the growth of the UAS industry has precipitated a large influx of "recreational" UAS pilots without formal knowledge or training regarding the effects or potential danger of UAS flight with the National Airspace System (NAS). While it is unclear what, if any, pilot certification requirements will ultimately apply to UAS pilots operating for commercial purposes under the final rulemaking process, there is a present need for training and dissemination of the applicable federal aviation regulations and flight characteristics of UAS to the general public; specifically current and potential UAS operators. UAS flight and ground demonstration and instruction for compensation utilizing the current system of certificated flight instructors provides economic incentive to accomplish the public goal of integration of both recreational and commercial UAS into the NAS while promoting safety and maintenance public awareness of current regulations affecting UAS operation.

Exemptions Provide a Level of Safety Equal to or Greater than the Existing Level under Current Regulations

The use of UAS operated under the requested exemptions as set forth above have the capacity to operate with less risk of accident or injury and the associated loss of property or life while performing the same aerial work services offered in manned aircraft in certain situations where extended operational range and limited time aloft are not a factor. Likewise, UAS flight and ground demonstration and instruction for compensation promote and encourage the existing system of certificated flight instructors to participate in the public educational process utilizing UAS rather than manned aircraft.

Manned aircraft are at risk of fuel spillage and fire in the event of an incident or accident. The DJI Phantom 2 Vision+ and Inspire 1 carry no fuel, and therefore the risk of fire following an incident or accident due to fuel spillage is eliminated.

This petition for exemption does not propose an electronic means to monitor and communicate with other aircraft, such as transponders or sense and avoid technology. Rather the risk is mitigated by placing limits on altitude, requiring stand-off distance from clouds, permitting daytime operations only, and requiring that the UAS be operated within VLOS and yield right of way to all manned operations. Additionally, the Proposed Conditions and Limitations provide that the Cirrus will request a notice to airmen (NOTAM) prior to operations to alert other users of the NAS.

Cirrus' UAS has the capability to operate safely after experiencing certain in-flight contingencies or failures and uses an auto-pilot system to maintain UAS stability augmentation and control. The UAS is also able to respond to a loss of GPS or a lost-link event with pre-coordinated automated flight maneuvers. These safety features provide an equivalent or higher level of safety compared to a manned aircraft holding an airworthiness certificate (restricted or otherwise) performing a similar operation.

Federal Register Summary

Cirrus Exploration Company, including its chief pilot Craig E Bryan, seeks exemption from the following regulations for the purpose of conducting flight instruction and commercial "aerial work" flight operations utilizing Unmanned Aerial Systems ("UAS") as set forth under the provisions of 14 CFR Section 119.1 (e)(1) Student instruction, Section 119.1 (e)(4)(iii) Aerial photography or survey, and Section 119.1 (e)(4)(vi) Powerline or pipeline patrol:

Relief considered (14 CFR)	FAA Consideration or Action Requested
Part 21	Relief not necessary pursuant to prior exemption[1]
45.23(b)	Relief not necessary pursuant to prior exemption[1]
61.31(a)	Relief not necessary (Section 333 of P.L. 112-95)[2]
61.31(c)	Relief not necessary (Section 333 of P.L. 112-95)[2]
61.31(d)	Relief not necessary (Section 333 of P.L. 112-95)[2]
91.7(a)	Relief granted in prior exemption with conditions and limitations[1]
91.7(b)	Relief not necessary pursuant to prior exemption[1]
91.9(b)(2)	Relief not necessary pursuant to prior exemption[1]
91.103(b)	Relief not necessary pursuant to prior exemption[1]
91.109(a)	Relief not necessary pursuant to prior exemption[1]
91.119	Relief [paragraph (c)] granted in prior exemption with conditions and limitations[1]
91.121	Relief granted in prior exemption with conditions and limitations[1]
91.151(a)	Relief [paragraph 91.151(a)(1), day] granted in prior exemption with conditions and limitations[1]
91.203(a) and (b)	Relief not necessary pursuant to prior exemption[1]
91.405(a)	Relief granted in prior exemption with conditions and limitations[1]
91.407(a)(1)	Relief granted in prior exemption with conditions and limitations[1]
91.409(a)(1) and (2)	Relief granted in prior exemption with conditions and limitations[1]
91.417(a) and (b)	Relief granted in prior exemption with conditions and limitations[1]

Additional Information Offered in Support of this Petition for Exemption

Cirrus chief pilot, Craig E Bryan ("Bryan"), operated various manned aircraft, including fixed-wing and rotorcraft, for commercial purposes including aerial work and flight instruction since 1983. Additionally, Bryan has operated commercially available UAS vehicles for the past three years for non-commercial personal use in order gain flight experience and familiarity with the operating characteristics and limitations of the UAS and its videography and photography systems. As a result it is believed there are certain aerial work situations, where the range and time aloft limitations of UAS are not a factor, whereby aerial work may be conducted with greater safety and less risk to persons or property on the ground while offering the same or improved level of aerial work product. Manned aircraft platforms such as airplanes and helicopters often subject the occupants as well as persons and property on the ground to higher levels of risk for accident or injury even while being operated pursuant to all of the applicable federal aviation regulations.

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[1] *In the matter of Douglas Trudeau, Realtor, Regulatory Docket No. FAA-2014-0481*

[2] Relief from this section is not necessary under the statutory criteria provided in *Section 333 of P.L. 112-95 in reference to 49 USC Section 44794* given the size, weight, speed, and limited operating area associated with the proposed UAS

The DJI Phantom 2 Vision+ and the DJI Inspire 1 UAS are both commercially produced and widely available aerial videography and photography platforms utilizing advanced GPS enabled stability augmentation and control systems including "failsafe" features allowing the operator to manually take control of the aircraft or initiate an automated "return to home" feature in the event of adverse inflight events. The UAS also incorporates automated "failsafe" features to initiate "return to home" or "autoland" commands in the event of loss of control signal link or diminished battery output or capacity.

The manufacturer, DJI, provides comprehensive operational and safety manuals for both UAS and all flights will be conducted in accordance with the requirements and guidance issued in these manuals.

Cirrus states that § 91.7(a) prohibits the operation of an aircraft without an airworthiness certificate. Cirrus asserts that since there is currently no certificate applicable to his operation, this regulation is inapplicable.

Cirrus states that § 91.9(b)(2) requires an aircraft flight manual in the aircraft, however since there are no pilots or passengers on board his aircraft and given its size, this regulation is inapplicable. Cirrus further indicates an equivalent level of safety will be achieved by maintaining a safety/flight manual with the UAS ground station.

Proposed Conditions and Limitations

Cirrus (also hereafter referred to as the operator) proposes the following Proposed Conditions and Limitations in the form of a proposed Grant of Exemption:

The following documents, including any updates or revision by the manufacturer, provided by the operator in its petition are incorporated by reference, and are hereinafter referred to as operating documents:

1) DJI Inspire 1 User Manual (EN) v1.0
2) DJI Inspire 1 Safety Guidelines v1.0
3) DJI Intelligent Flight Battery Safety Guidelines v1.0
4) DJI Phantom 2 Vision+ User Manual (EN) v1.6
5) DJI Phantom 2 Vision+ Pilot Training Guide (EN) v1.1
6) DJI Smart Flight Battery Safety Guidelines(EN, FR, DE and JP)

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 following aircraft described in the operating documents which are quad-rotor aircraft weighing less than 55 pounds:

   DJI PHANTOM 2 Vision+ Unmanned Aircraft System (manufacturer published gross weight 2.74 pounds) ; and,

   DJI Inspire 1 Unmanned Aircraft System (manufacturer published gross weight 6.47 pounds).

   Proposed operations of any other aircraft will require a new petition or a petition to amend this grant.

2) The UAS may not be flown at an indicated airspeed exceeding 43 knots.[3]

3) The UAS must be operated at an altitude of no more than 500 feet above ground level (AGL), as indicated by the procedures specified in the operating documents. All altitudes reported to ATC must be in feet AGL.

4) The UAS 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 commercial "aerial work" flight operations [as defined by 14 CFR Section 119.1 (e)(1) Student instruction, Section 119.1 (e)(4)(iii) Aerial photography or survey, and Section 119.1 (e)(4)(vi) Powerline or pipeline patrol] must utilize a visual observer (VO). The UAS must be operated within the visual line of sight (VLOS) of the 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. 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) All flight instruction operations must be conducted such that the flight instructor has immediate access to the master ground control station (either through physical proximity or electronic access through a slave ground controller) for the purpose of assuming positive control of the UAS in the event of loss of control by a trainee or person acting under the provisions of a student pilot certificate issued by the FAA.

7) The operating documents and this grant of exemption 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 upon request. The operator must also present updated and revised documents if he 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 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) 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 UAS is prohibited from

[3] Maximum published velocity [DJI Phantom 2 Vision+ (29.16 knots), DJI Inspire 1 (42.76 knots)]

operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight. The Ground Control Station must be included in the preflight inspection. All maintenance and alterations must be properly documented in the aircraft records.

9) 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 aircraft records.

10) The pre-flight inspection section in the operating documents must account for all discrepancies, i.e. inoperable components, items, or equipment, not already covered in the relevant sections of the operating documents.

11) The operator must follow the UAS manufacturer's aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements.

12) 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 records, including total flight hours, description of work accomplished, and the signature of the authorized person returning the UAS to service.

13) Each UAS operated under this exemption must comply with all manufacturer Safety Bulletins.

14) The authorized person must make an entry in the aircraft record of the corrective action taken against discrepancies discovered between inspections.

15) UAS operations must be conducted by a PIC possessing at least a private pilot certificate and at least a current third-class medical certificate. 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.

16) Prior to operations conducted for the purpose of flight instruction or aerial work as defined by 14 CFR Section 119.1 (e)(1) Student instruction, Section 119.1 (e)(4)(iii) Aerial photography or survey, and Section 119.1 (e)(4)(vi) Powerline or pipeline patrol, the PIC must have accumulated and logged, in a manner consistent with 14 CFR 61.51(b), a minimum of 25 hours of total time as a UAS rotorcraft pilot including at least 10 hours logged as a UAS pilot with a multi-rotor UAS. Prior documented flight experience that was obtained in compliance with applicable regulations may satisfy this requirement. Training, proficiency, and experience-building flights can also be conducted under this grant of exemption to accomplish the required flight time. However, said training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights the PIC is required to operate the UAS with appropriate distances in accordance with 14 CFR 91.119.

17) Prior to operations conducted for the purpose of flight instruction or aerial work as defined by 14 CFR Section 119.1 (e)(1) Student instruction, Section 119.1 (e)(4)(iii) Aerial photography or survey, and Section 119.1 (e)(4)(vi) Powerline or pipeline patrol, the PIC must have accumulated and logged, in a manner consistent with 14 CFR 61.51(b), a minimum of 5 hours as UAS pilot operating the make and model of the UAS to be used in operations under the exemption; 5 hours make and model time may be included in the 10 hours of multi-rotor time prescribed above. The PIC must accomplish 3 take-offs and landings in the preceding 90 days (for currency purposes). Training, proficiency, experience-building, and take-off and landing currency flights can be conducted under this grant of exemption to accomplish the required flight time and 90 day currency. However, said training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights the PIC is required to operate the UAS with appropriate distances in accordance with 14 CFR 91.119.

18) The operator may not permit the PIC to operate the UAS for the purpose of flight instruction or aerial work as defined by 14 CFR Section 119.1 (e)(1) Student instruction, Section 119.1 (e)(4)(iii) Aerial photography or survey, and Section 119.1 (e)(4)(vi) Powerline or pipeline patrol, unless the PIC has demonstrated and logged in a manner consistent with 14 CFR 61.51(b), 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 people, vessels, vehicles and structures.

19) 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).

20) The UAS may not operate within 5 nautical miles of an airport reference point as denoted on a current FAA-published aeronautical chart unless, prior to such operation, the PIC coordinates and obtains authorization and airspace clearance from any National Airspace System (NAS) controlling authority having jurisdiction over the affected airspace and establishes and maintains continuous verbal communication or contact with said authority (ATC) through radio or telephonic methods for the duration of flight.

21) The UAS 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.

22) If the UAS 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.

23) The PIC must abort the flight in the event of unpredicted obstacles or emergencies in accordance with the operating documents.

24) The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough power to fly at normal cruising speed to the intended landing point and land the UAS with 30% battery power remaining.

25) The operator must obtain an Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA) prior to conducting any operations under this 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.

26) 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.

27) Before conducting operations, the radio frequency spectrum used for operation and control of the UAS must comply with the Federal Communications Commission (FCC) or other appropriate government oversight agency requirements.

28) The 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 UAS is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

29) The UAS must remain clear and yield the right of way to all manned aviation operations and activities at all times.

30) The UAS may not be operated by the PIC from any moving device or vehicle.

31) The UAS may not be operated over congested or densely populated areas.

32) 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 UAS 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 UAS, flight operations must cease immediately and/or;

b. The aircraft is operated near vessels, vehicles or structures where the owner/controller of such vessels, vehicles or structures has granted permission 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, and;

c. Operations nearer to the PIC, VO, operator trainees or essential persons do not present an undue hazard to those persons per § 91.119(a).

33) All operations shall be conducted over private or controlled-access property 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.
34) 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.

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.

Respectfully submitted,

Cirrus Exploration Company

Craig E Bryan, Chief Pilot

Attachments:

Note: All attachments provided by hyperlink to insure document revision currency and compliance with manufacture's copyright policy

1) DJI Inspire 1 User Manual (EN) v1.0
http://download.dji-innovations.com/downloads/inspire_1/en/Inspire_1_User_Manual_v1.0_en.pdf
2) DJI Inspire 1 Safety Guidelines v1.0
http://download.dji-innovations.com/downloads/inspire_1/en/Inspire_1_Safety_Guidelines_en.pdf
3) DJI Intelligent Flight Battery Safety Guidelines v1.0
http://download.dji-innovations.com/downloads/inspire_1/en/Intelligent_Flight_Battery_Safety_Guidelines_en.pdf
4) DJI Phantom 2 Vision+ User Manual (EN) v1.6
http://download.dji-innovations.com/downloads/phantom_2_vision_plus/en/Phantom_2_Vision_Plus_User_Manual_v1.6_en.pdf
5) DJI Phantom 2 Vision+ Pilot Training Guide (EN) v1.1
http://download.dji-innovations.com/downloads/phantom_2_vision_plus/en/Phantom_2_Vision_Plus_Pilot_Training_Guide_v1.1_en.pdf
6) DJI Smart Flight Battery Safety Guidelines(EN, FR, DE and JP)
http://download.dji-innovations.com/downloads/phantom_2_vision_plus/Smart_Flight_Battery_Safety_Guidelines.pdf