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

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

June 16, 2015

Exemption No. 11830
Regulatory Docket No. FAA–2015–1167

Mr. Thomas Davis
Partner
Drone for Hire, LLC
4813 Enterprise Way #H
Modesto, CA 95356

Dear Mr. Davis:

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

By letter dated March 27, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Drone for Hire, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct precision agriculture, emergency services operations, aerial inspections.

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. However, the FAA received three comments in support of the petition made to the docket.

Airworthiness Certification

The UAS proposed by the petitioner is a Drone for Hire Y6-Scout.

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

[1] Aerial data collection includes any remote sensing and measuring by an instrument(s) aboard the UA. Examples include imagery (photography, video, infrared, etc.), electronic measurement (precision surveying, RF analysis, etc.), chemical measurement (particulate measurement, etc.), or any other gathering of data by instruments aboard the UA.

Conditions and Limitations

In this grant of exemption, Drone for Hire, LLC is hereafter referred to as the operator.

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

1. Operations authorized by this grant of exemption are limited to the Drone for Hire Y6−Scout when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

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

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

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

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

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

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

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

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

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

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

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

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

13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.

16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.

17. The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.

18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.

19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.

20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.

21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The exemption holder may apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N−Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.

23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

24. The UA must remain clear and give way to all manned aviation operations and activities at all times.

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

26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
    a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and
    b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

    The PIC, VO, operator trainees or essential persons are not considered nonparticipating persons under this exemption.

27. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative. Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.

28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS−80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

If this exemption permits operations for the purpose of closed-set motion picture and television filming and production, the following additional conditions and limitations apply.

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.

30. At least 3 days before aerial filming, the operator of the UAS affected by this exemption must submit a written Plan of Activities to the local Flight Standards District Office (FSDO) with jurisdiction over the area of proposed filming. The 3-day notification may be waived with the concurrence of the FSDO. The plan of activities must include at least the following:
    a. Dates and times for all flights;
    b. Name and phone number of the operator for the UAS aerial filming conducted under this grant of exemption;
    c. Name and phone number of the person responsible for the on-scene operation of the UAS;
    d. Make, model, and serial or N−Number of UAS to be used;
    e. Name and certificate number of UAS PICs involved in the aerial filming;
    f. A statement that the operator has obtained permission from property owners and/or local officials to conduct the filming production event; the list of those who gave permission must be made available to the inspector upon request;
    g. Signature of exemption holder or representative; and
    h. A description of the flight activity, including maps or diagrams of any area, city, town, county, and/or state over which filming will be conducted and the altitudes essential to accomplish the operation.

31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

Unless otherwise specified in this grant of exemption, the UAS, the UAS PIC, and the UAS operations must comply with all applicable parts of 14 CFR including, but not limited to, parts 45, 47, 61, and 91.

This exemption terminates on June 30, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

Drone for Hire, LLC's Petition for Exemption for the Y6-Scout Unmanned Aerial System

FAA Rules Docket: _____

Submitted on 27 Mar 2014

Thomas Davis, Partner

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* Documents were submitted confidentially for proprietary reasons and will not be available to the public

A. Petition Summary

Pursuant with Section 333 of the FAA Modernization and Reform Act of 2012, Drone for Hire, LLC, (DFH), requests exemption from the following Federal Aviation Regulations that are found under Title 14 of the Code of Federal Regulations (CFR): 14 CFR parts §§ 61.113(a), 91.119(c), 91.121(a), and 91.151. DFH seeks expedited approval and exemption from the CFRs listed above in order to operate the Y6-Scout Unmanned Aircraft System (UAS) for the purpose of providing services in the domains of Precision Agriculture, Emergency services operations, Aerial inspections. Operation of the Y6-Scout by DFH will follow strict operational limitations as outlined in this document and all recommendations by the FAA.

B. Background

1. Drone for Hire, LLC

Established in 2010, Drone For Hire (DFH) specializes in research, design and manufacturing of small Unmanned Aircraft Systems (UAS). Operating out of Modesto California, DFH has been working with agriculturalist, industry leaders, and educators to identify UAS applications, define best practices of UAS operations, and refine our aircraft designs.

2. Y6-Scout

The Y6-Scout is the colmination of DFH's four years research, design and testing effort to develop a durable and scalable multi-payload small Unmanned Aircraft System. The Y6-Scout's domains of operations included; Precision Agriculture, Aerial inspections, Emergency Services, and Aerial Photography. The Y6-Scout unique and robust airframe design is constructed of extruded aluminum tubing and ABS plastic. The Y6-Scout measures less than 22"w x 20"l. and its maximum takeoff weight is 7.5 lb, capable of carrying payloads of up 2 lbs and can remain airborne for approximately 10 minutes. The Y6-Scout fault-tolerant propulsion system consist of 6 electric motors powered by a lithium polymer battery enabling the aircraft to operate a speeds from 0 - 20 mph and from 0 - 400 ft AGL. The UAS can take off and land vertically and can be launched and recovered from any stable surface or by hand. The aircraft is linked to the ground control station via a 2.4 GHz

radio with a maximum data link range of 2 kilometers/1.1 nautical miles/1.3 statute miles. If the onboard autopilot system detect a critical situation at any time (low battery, weak data link signal, etc.) the Y6-Scout will automatically initiate a preprogrammed safety procedure.

The Y6-Scout has extensive flight experience and a history of operational success. Moreover the Y6-Scout has/will been an awarded an Airworthiness certification by the FAA for Visual Line of Sight (VLOS) operations.

For additional information on the Y6-Scout, reference Appendix B (Y6-Scout flight Manual), Appendix C (Y6-Scout Inspection and Maintenance) which specify manufacturing information, aircraft performance, operating limits, normal and emergency procedures, fail-safe features, and maintenance and inspection procedures.

C. Statutory Authority

1. FAA Modernization and Reform Act of 2012, Section 333

Section 333 (a) states that the FAA "shall determine if certain unmanned aircraft systems may operate safety in the national airspace system before completion of the plan and rulemaking required by Section 332". Section 333 (b) then lists several factors that should be considered in determining which UAS' would be eligible for expedited integration into the National Airspace System (NAS). Specifically UAS' that "as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to the users of the national airspace system or the public, or pose a threat to national security". If a UAS meets the criteria laid forth in Section 333 (b), Section 333 (c) then gives the FAA the authority to decide if an airworthiness certification as specified by Title 49 United States Code, Section 44704 is even required for operation. Section 333 (c) specifically states that the FAA can determine "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". Thus, the FAA has the ability to allow a UAS that meets the criteria put forth in Section 333 (b) to operate within the NAS without an airworthiness certification as long as the UAS does not pose any hazard or threat to the NAS, public, and national security.

2. How DFH meets the criteria laid forth in Section 333

Below are the criteria laid forth in Section 333 (b) and a detailed description of how DFH meets each of these criteria.

a. Size, Weight, and Speed

The Y6-Scout's weighs 7.5 lbs., has a length of 21" and operates at cruising speeds of 0 mph - 20 mph. This small, lightweight aircraft that operates at relatively slow speeds will pose little to no hazard to people or structures on the ground, thus making it an exponentially safer alternative to manned, fixed wing aircraft for aerial imaging.

b. Operational Capability

The primary function of the Y6-Scout is to provide an agile and stable aerial platform for remote sensing at altitudes at or below 400 ft AGL. The Y6-Scouts' interchancable payload modules include; thermal imaging camera, visual camera, near-infrared camera, and ultrasonic proximity sensor. High resolution data generated from these cameras and sensors offer a wide range of applications. In the domains of precision agriculture and water resource management the Y6-Scout can provide timely data to identify stressed plants and monitor water resources. For applications in industrial automation the Y6-Scout offers a cost effective, environmentally friendly, and safe solution for aerial inspections. The data gathering capabilities of the Y6-Scout will benefit individuals and companies, which is of great benefit to the economy and the public.

The UAS can take off and land vertically and can be launched and recovered from any stable surface or by hand, requiring no runway for take-off and landing and no transit to and from the site. Once airborne, the Y6-Scout will fly at an altitude of 400 ft. AGL or less over the designated area. Prior to flight, the Pilot in Command (PIC) sets a designated flight area and flight parameters to ensure that the Y6-Scout will remain within the confines of the approved site and not exceed a maximum altitude 400 ft. AGL. If onboard sensors detect a critical issue at any time, such as a low battery state or loss of GPS signal, the Y6-Scout will immediately execute preprogrammed safety procedures (Reference Appendix A). The Y6-Scout's small operational footprint and built-in safety protocol provide a much safer alternative for aerial imaging and would pose a minimal hazard to the NAS or public.

c. Proximity to Airports/Populated Areas

The Y6-Scout will only operate over agricultural and/or industrial operation locations for the purpose of collecting aerial imagery and sensor data. DFH protocols

ensure all Y6-Scout operations avoid overflight of humans. In addition, if operation are within 5NM of an airport DFH will coordinate with appropriate FAA authorities/air traffic control agencies.

d. Visual Line of Sight (VLOS)

The Y6-Scout will be flown in accordance with day Visual Flight Rules (VFR) and only in Visual Meteorological Conditions (VMC) during day-light hours. The Y6-Scout will operate within 1 NM and VLOS of the PIC (and the Safety Observer positioned next to the PIC) at an altitude 400 ft. AGL or less. The Safety Observer will be responsible for ensuring that the Y6-Scout remains within VLOS at all times and will also assist in spotting potential hazards.

3. Other Relevant Factors

a. Operational Limitations

DFH has established the following operational limitations for Y6-Scout flights over designated areas.

- Y6-Scout flights are only permitted over designated areas
- The Y6-Scout will operate at or below 400 ft. AGL
- The Y6-Scout will operate within 1 NM and within VLOS of the PIC and Safety Observer
- The Y6-Scout will operate in accordance with Day Visual Flight Rules and only in Visual Meteorological Conditions during daylight hours
- All employees working on-site will be thoroughly briefed on Y6-Scout operations prior to operations commencing
- Y6-Scout operations will be conducted by commercially certified pilots who have completed DFH Training
- If the PIC or Safety Observer spot a potential hazard, such as a manned aircraft within close proximity to the designated flight area, the PIC will immediately land the Y6-Scout and operations will only resume after the hazard is clear of the area
- DFH will also follow any guidance from the FAA in accordance with Sec 333 (c) which states that after determining if UAS meets the criteria for safe operation that the FAA "shall [also] establish requirements for the safe operation of the" UAS in the NAS.

D. Basis for Petition

1. Name and Address of the Petitioner

Drone for Hire, LLC

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Modesto, CA 95356

Phone: 209.818.4109

Email: Thomas.Davis@Drone-For-Hire.com

2. Specific Sections of 14 CFR from which Drone for Hire Seeks Exemption

Below are the sections from which DFH seeks exemption, with specifics on the extent of relief sought, reason for relief, and why exemption would not adversely affect safety.

Section 61.113(a); Drone for Hire will conduct operations in compliance with the following definitions and guidelines: PIC is defined as the person responsible for the safe ground and flight operation of the aircraft and onboard systems. The PIC/Operator may be augmented by supplemental pilots/operators however; overall responsibility of the flight, regardless of who may be piloting the UA, will reside with a single PIC/Operator who retains ultimate decision-making authority. The PIC/Operator shall be fully qualified to operate the UAS IAW applicable Service directives. PICs/Operators must not perform crew duties for more than one UAS at a time. PICs/Operators are not allowed to perform concurrent duties both as pilot/operator and observer. Observer: All observers must have an understanding of federal aviation regulations applicable to the airspace where the UA will operate. Observers are considered a crew member of the UAS. Observers must not perform crew duties for more than one UAS at a time. Observers are not allowed to perform concurrent duties both as pilot and observer. Ancillary personnel such as flight engineers/observers/support personnel must be thoroughly familiar with and possess operational experience of the equipment being utilized. If the subject systems being utilized are for observation and detection of other aircraft for collision avoidance

purposes, they must be thoroughly trained on collision avoidance procedures and techniques and have direct communication with the UAS pilot, observer, and other applicable personnel on an inter-communication system.

Drone-for-Hire Pilots in Command are Commercial Certified Pilots and have overall responsibility for flight operations. All other personnel involved with Drone for Hire operations, while they may not have a Commercial Pilot Certificate have received the same level of training in UAS operations as the Pilot in Command and are necessary component of flight safety and a key factor in crew resource management during UAS flight operations.

Based on the above operational guidelines and the high level of training all crew members receive at Drone for Hire, we feel the exemption would not adversely affect safety. In addition we feel the oversight of a Commercial Certified Pilot during all operations meet the intent of 14 CFR Part 61.113(a).

Section 91.121 requires a person operating an aircraft to maintain cruising altitude or flight level by reference to an altimeter that is set to the elevation of the departure airport or barometric pressure. The Y6-Scout has a barometer integrated auto pilot system. The auto pilot system recalibrates barometer when initialized. The Y6-Scout height is constantly monitored by the pilot in command and spotter, thus ensuring operation at safe altitudes. For these reasons, Drone for Hire requests an exemption to § 91.121's altimeter requirements.

Section 91.119 prescribes the minimum safe altitudes under which aircraft may not operate, including 500 feet above the surface and away from any person, vessel, vehicle, or structure in non-congested areas. See 14 C.F.R. § 91.119(c). Section § 91.119(d)(1) allows for a helicopter to operate at less than those minimum altitudes when it can be operated "without hazard to persons or property on the surface," provided that "each person operating the aircraft complies with any routes or altitudes

specifically prescribed for helicopters by the FAA." To demonstrate the intended agricultural-related services and industrial automation applications, the Y6-Scout is normally operated at approximately 20 feet to 400 feet above the surface of a field or other agricultural area or within an industrial complex. In addition, due to the nature of the Y6-Scout's operation, the pilot in command and the designated spotter may at times be as much as 500 feet away during operation. The successful testing of the Y6-Scout, involving more than 15 flight hours, demonstrates that the Y6-Scout's can be safely used at these lower altitudes and closer operating environments. At higher altitudes the Y6-Scout co-axial propulsion system provides failsafe redundancy in the event of a single propulsion unit failure. Thus, when operated for these purposes, the Y6-Scout will be at least as safe as operating within the specified regulatory requirements. Furthermore, by operating at such lower altitudes, the Y6-Scout will not interfere with other aircraft that are subject to the minimum safe altitude regulations. An exemption from § 91.119's minimum safe altitude regulations is therefore warranted.

Section 91.151(a,1,2) states "No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed

(1) During the day, to fly after that for at least 30 minutes; or

(2) At night, to fly after that for at least 45 minutes."

Maximum safe flight time for the Y6-Scout is 10 minutes. All flight are executed during daylight under line of sight operation provided VFR conditions exist. The Y6-Scout uses lithium polymer batteries as it power source. During flight operations battery levels are displayed on the ground station terminal and available to the PIC for review. In addition the Y6-Scout is equipped with an LED indicator to notify the operator of low battery status. Moreover, the Y6-Scout autopilot system is configured to return to home if the battery voltage drops below a configured parameter. The requirements under CRF §91.151(a,1,2) (b) are not applicable to the operation of the Y6-Scout.

3. <u>How request benefits public as a whole</u>

The Y6-Scout is a safe, efficient, and an economical alternative to manned, fixed wing aircraft or helicopters that are currently being used to conduct aerial imaging of agricultural and industry . There are a four major reasons why the public would benefit from granting DFH exemptions from these regulations. Authorizing Y6-Scout flights over designated areas would 1) reduce the number of manned aircraft in the NAS, 2) reduce air and noise pollution, 3) reduce the risk to life and property on the ground, and 4) increase agricultural and industrial economic growth.

Utilizing the Y6-Scout in lieu of a traditional manned aircraft will result in the overall reduction of manned aircraft in the NAS. Thus there will be less aircraft that require control and coordination with Air Traffic Controllers (ATC). Because the Y6-Scout can take-off and land on-site and operate at an altitude of 400 ft. AGL (or less) within VLOS of the PIC there is no need for ATC to provide coordination during ground, take-off, departure, transit, arrival, and landing phases of flight. As the skies over the United States get busier and busier, any small effort to lighten the load of the Air Traffic Controllers would be of great benefit to the public.

At 7.5 lbs. the battery operated Y6-Scout with an electric motors provides a much quieter alternative to manned aircraft. Traditionally a manned aircraft would have to transit from the departure airport to the desired site and fly at low altitudes to achieve high-resolution imagery. The Y6-Scout will require no transit time, and the electric motors will be exponentially quieter than an internal combustion motor on passenger aircraft that is typically used to conduct aerial imaging. In addition the Y6-Scout requires no fuel since it is battery operated. A manned aircraft on the other hand typically burns 20-30 gallons of aviation fuel per hour which is polluting the air not only over the site but over the path of transit and around the airport. Conducting aerial imaging with the Y6-Scout in lieu of a manned aircraft would thus greatly reduce both air pollution and noise pollution which is of great benefit to the public.

Using the Y6-Scout would also greatly reduce if not completely eliminate the risk to life and property on the ground. The Y6-Scout's small size and weight pose no hazard to people or structures on the ground as opposed to a manned aircraft, which has a much greater potential for collateral damage. In addition the Y6-Scout is unmanned and as a result the risk associated with piloting this aircraft is non-existent. Overall the Y6-Scout provides a much safer alternative to manned, aircraft operations for the purpose of collecting aerial imagery.

Lastly, Economic Potential; the UAS industry has the potential to create 100,000 U.S. jobs and contribute $82 billion to the GDP by 2025. An estimated 80 percent of UAS growth will come in the emerging science of precision agriculture, providing spatial and temporal data to optimize crop health and resource management.[1]

California's more than 80,500 farms and ranches received a record $44.7 billion for their output last year, and California remained the number one state in cash farm receipts with 11.3 percent of the U.S. total.[2] As the state's primary agricultural region, the Central Valley continues to take a lead role in agricultural innovation. At the same time, it faces challenges in land and resource management that can be addressed by advances in UAS technology. Drone for Hire aircraft are specifically design to meet the needs of the UAS industry as it applies to agriculture and industrial automation.

Drone for Hire is dedicated to developing UAS technology for civilian applications by providing California's Central Valley growers, educators, and business, with unique opportunities to help innovate and grow UAS technology from the ground-up. Results of the non-proprietary research conducted by DFH provides a conduit for new market identification and product refinement. DFHs' unique business model encourages market expansion of UAS's utilization while providing economic benefits to California's Central Valley community.

4. Additional information, views, and arguments

The following documents have been included as Appendices to this Petition. Appendix A, B, C, D, and E have been submitted confidentially for proprietary reasons and will not be available to the public.

- o 8130.34b Appendix D safety checklist (Appendix A)
- o Y6-Scout User Manual (Appendix B)
- o Y6-Scout Inspection and Maintenance (Appendix C)
- o Drone For Hire Pilot training program (Appendix D)

5. Summary for Federal Register

Pursuant with Section 333 of the FAA Modernization and Reform Act of 2012, Drone For Hire, LLC requests exemption from the following Federal Aviation Regulations that are found under Title 14 of the Code of Federal Regulations: 14 CFR parts §§ 61.113(a), 91.119(c), 91.121(a), and 91.151. Exemption from these regulations would allow Drone for Hire, LLC to operate the Y6-Scout Unmanned Aerial System over domestic agricultural and industrial sites for the purpose of providing high-resolution aerial imagery and data.