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

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

August 5, 2015

Exemption No. 12355
Regulatory Docket No. FAA–2015–1337

Mr. Scott Carlson
Aerial Imaging Systems
1947 Homewood Drive
Rockford, IL 61108

Dear Mr. Carlson:

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

By letter dated April 21, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Aerial Imaging Systems (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography and 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.

Airworthiness Certification

The UAS proposed by the petitioner is a DJI Phantom 2 Vision.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in consideration of the size, weight, speed, and limited operating area associated with the

aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

You have requested to use a UAS for aerial data collection[1]. The FAA has issued grants of exemption in circumstances similar in all material respects to those presented in your petition. In Grants of Exemption Nos. 11062 to Astraeus Aerial (*see* Docket No. FAA−2014−0352), 11109 to Clayco, Inc. (*see* Docket No. FAA−2014−0507), 11112 to VDOS Global, LLC (*see* Docket No. FAA−2014−0382), and 11213 to Aeryon Labs, Inc. (*see* Docket No. FAA−2014−0642), the FAA found that the enhanced safety achieved using an unmanned aircraft (UA) with the specifications described by the petitioner and carrying no passengers or crew, rather than a manned aircraft of significantly greater proportions, carrying crew in addition to flammable fuel, gives the FAA good cause to find that the UAS operation enabled by this exemption is in the public interest.

Having reviewed your reasons for requesting an exemption, I find that—

- They are similar in all material respects to relief previously requested in Grant of Exemption Nos. 11062, 11109, 11112, and 11213;
- The reasons stated by the FAA for granting Exemption Nos. 11062, 11109, 11112, and 11213 also apply to the situation you present; and
- A grant of exemption is in the public interest.

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, Aerial Imaging Systems 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, Aerial Imaging Systems 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 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 August 31, 2017, unless sooner superseded or rescinded.

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

Enclosures

April 21, 2015

U.S. Department of Transportation
Docket Management System
1200 New Jersey Avenue SE
Washington, D.C. 20590

Docket Number:

Re: Exemption Request; Section 333 of the FAA Modernization & Reform Act and Part 11 of the Federal Aviation Regulations from 14 C.F.R. 45.23(b); 14 CFR Part 21; 14 CFR 61.113 (a) & (b); 91.7 (a); 91.9 (b) (2); 91.103(b); 91.109; 91.119; 91.121; 91.151 (a); 91.203 (a) & (b); 91.405 (a); 91.407 (a) (1); 91.409 (a)(2); 91.417 (a) & (b).

Dear Sir or Madam:

Scott Carlson dba Aerial Imaging Systems. "Aerial Imaging Systems" hereby petitions the Secretary of Transportation and Federal Aviation Administration ("FAA") for exemption to the above referenced and below more fully described Federal Aviation Regulations, ("FARs") that currently may or may not apply to the recreational/business operations of model aircraft including small unmanned aerial vehicles/systems ("SUAVs").

1. Prefatory Statement to Petition

In June, 1981, the FAA published an advisory circular, AC 91-57, (an advisory publication giving non-regulatory information/guidance. Advisory circulars do not create or change regulations and are not binding on the public.) AC 91-57 was entitled "Model Aircraft Operating Standards" and gave non-regulatory suggestions to model aircraft operators on suggested procedures for operatating their models. This was the sole publication by the FAA which addressed model aircraft and SUAVs for the next nearly 25 years.

In September 2005, the FAA appeared to turn its attention toward unprecedented attempts at regulating model aircraft specifically the more modern SUAVs. The FAA, for the first time in history now termed these devises as Unmanned Aerial Systems ("UAS") seemingly to align with their attempts at enforcement. The FAA published "AFS-400 UAS POLICY 05-01 - Unmanned Aircraft Systems operations in the U.S. National Airspace System - Interim Operational Approval Guidance." This interim internal FAA memo expressly confirms that "[t]his policy is not meant as a substitute for any regulatory process. " Still, it purported to "require" a Certificate of Authorization ("COA") or Waiver to use SUAVs. The new FAA policy relied on legal/regulatory "authority" on the non-regulatory, AC 91-57.

In February, 2007 the FAA, published a 2007 "policy statement" in the Federal Register. The 2007 Policy Statement starts by defining " unmanned aircraft" as "a device that is used, or intended to be used, for flight in the air with no onboard pilot" and it purported to include "a remotely controlled model airplane used for recreational purposes." The FAA termed these devices UAS and then purported

to articulate the new FAA "policy" for "UAS" operations was that "no person may operate a "UAS" in the National Airspace System without specific authority." For the first time ever, the 2007 Notice purported to articulate two new alleged "rules": (1) Model aircraft can no longer be operated for a "business" purpose; and (2) a Model aircraft operated for a business purpose requires a COA, or special Certificate of Operating Authority and therefore is subject to the FARs.

Thereafter, beginning in 2007, and continuing to present, apparently based on there two new FAA internal "policies" and without citing to any actual federal law, or FARs, the FAA then sent various cease and desist notices to model aircraft SUAV operators describing the COA process and threatening to impose a $10,000 fine if they did not comply with the new FAA policies which the FAA indicated created a "ban" on using SUAVs for any "business purpose."

In 2012, following the FAA's attempts to regulate using internal policy memos, Congress enacted the Federal Aviation Administration Reform and Modernization Act, ["FRMA"]. The FRMA allows the Secretary of Transportation to "exempt" SUAVs from existing Federal Law, FARs to the extent any federal law or FAR actually currently applies to SUAVs.

As the Secretary/FAA are no doubt aware, these issues are presently pending before the NTSB's full panel of judges in *Pirker v. FAA*, Docket no. CP-217. Pending the NTSB president setting decision in the *Pirker* case, Petitioner respectfully makes this request as suggested by the FMRA and the FAA. *See* http://www.faa.gov/news/press_releases/news_story.cfm?newsId=16294. In the only other case in history where the FAA's attempts to regulate Model Aircraft/UAV has been tested, in *Texas Equuisearch v. Federal Aviation Administration*, the U.S. Court of Appeals for the District of Columbia Circuit, Case No. 14-1061, the Court ruled that FAA informal email/mail orders attempting to enforce it Model Aircraft/UAVs internal policies ar not legally binding.

Aerial Imaging Systems at all times has and operates their SUAVs following the safety guidelines of AC 91-57.

2. Petition for Exemption

With the above preface, pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 ("FMRA") and 14 C.F.R. Part 11, Aerial Imaging Systems, developer and operator of Small Unmanned Aerial Vehicles ("SUAV") equipped to conduct aerial photography/Inspection/ included but not limited to the following; Business Operations: over land, water-ways, and oceans; operation over/in non-restricted National Parks, National Forests, flight in non-navigable arespace, using non-intrusive recording devices, operation in otherwise unrestricted U.S. States/Territories hereby applies for an exemption from the listed Federal Aviation Regulations ("FARs") to allow commercial operation of it's SUAVs, so long as such operation are conducted within and under the conditions outlined herein or as may be established by the FAA as required by Section 333.

As described more fully below, the requested exemption would permit the operation of SUAVs under controlled conditions in airspace that is 1) limited; 2) predetermined; and 3) controlled as to accesss. The exemption would also provide safety enhancements to the already safe operation within the aerial photography, film and television industry presently using conventional aircraft and small, unmanned and relatively inexpensive SUAVs.

Approval of this exemption would hereby enhance safety and fullfill the Secretary of

Transportation's (the FAA Administrator's) responsibilities to "... establish requirements for the safe opoeration of such aircraft systems in the National Airspace System." Section 333(c) of the FMRA.

3. Name and Address of the Petitioner

Scott Carlson dba "Aerial Imaging Sytems."
Phone: 815-282-3210
Email: scottecarlson459@gmail.com
Address: 1947 Homewood Dr. Rockford, Ill. 61108

4. Regulations Petitioner Petitions for Exemptionm, If Such Regulations Apply to SUAVs

14 C.F.R. Part 21	14 C.F.R. 91.109 (a)	14 C.F.R. 405 (a)
14 C.F.R. 45.23 (b)	14 C.F.R. 91.11914 C.F.R. 407 (a) (1)	
14 C.F.R. 61.113 (a)&(b)	14 C.F.R. 91.12114 C.F.R. 409 (a) (2)	
14 C.F.R. 91.7 (a)	14 C.F.R. 91.151 (a)	14 C.F.R. 417 (a) & (b)
14 C.F.R. 91.9 (b) (2)	14 C.F.R. 91.203 (a)&(b)	
14 C.R.R. 91.103		

This exemption application is expressly submitted to fulfill Congress' goal in passing Section 333 (a) through (c) of the Reform Act. This law directs the Secretary of Transportation to consider whether certain unmanned aircraft systems may operate safely in the National Airspace System ("NAS") before completion of the rulemaking required under Section 332 of the FMRA. In making this determination, the Secretary is required to determine which types of SUAVs/UASs do not create a hazard to user of the NAS, or the public, or pose a threat to national security in light of the following:

A. The SUAVs size, weight, speed, and operational capability;
B. Operation of the SUAVs in close proximity to airports and populated areas;
C. Operation of the SUAVs within visual line of sight of the operator. FMRA 333 (a)

Lastly, if the Secretary determines that such vehicles "may operate safely in the National Airspace System, the Secretary shall establish requirements for the safe operation of such aircraft in the National Airspace System." (d. Section 333(c) (emphasis added). The Petitioner interprets this provision to place the duty on the Secretary/FAA Administrator to not only process applications for exemptions under section 333, but for the Secretary/Administrator to affirmatively craft conditions for the safe operation of the SUAVs, if it should be determined that the conditions set forth herein do not fulfill the statutory requirements for approval.

The Federal Aviation Act expressly grants the Secretary/FAA Administrator the authority to issue exemptions. This statutory authority, by its terms, includes exempting civil aircraft, as the term is defined under 401.01 of the Act, which currently may or hereafter may include SUAVs, from the requirement that all civil aircraft must have a current airworthiness certificate.

The Secretary/FAA Administrator may grant an exemption from a requirement of a regulation prescribed under subsection (a) or (b) of this section or any sections 44702-44716 of this title if the Secretary/FAA Adminstrator finds the exemption in the public interest. 49 U.S.C. 44701 (f). *See also* 49 USC 44711(a); 49 USC 44704; 14 C.F.R. 91.203 (a)(1).

Aerial Imaging Systems SUAVs are multi-rotorcraft DJI Phantom 2 Vision aircraft with digital

gyrascope stabilization and GPS, Phantom 2 vision weight is 1160g, weighting 55 lbs or less. Max flight speed is 15 m/s, accent 6 m/s, decent 2 m/s. The phantom 2 vision has the capability to hover and move in the vertical and horizontal plane independently/simultaneously. They will operate in line of sight and will operate only within the areas described herein. Such operations will insure that the SUAVs will "not create a hazard to users of the NAS or the "public" as described in the FMRA 333(b).

Given the small size of the SUAVs involved, and the limited environment within which they will operate, the Petitioner falls squarely within that zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of SUAVs to commence immediately. Also, due to the size of the SUAVs and the restricted areas in which the relevant SUAVs will operate, approval of the application presents no National Security Issue. Given the clear direction in FMRA 333, the authority contained in the Federal Aviation Act, as amended, the strong equivalent level of safety surrounding the proposed operations, and the significant public benefit, including enhance safety, reduction in enviromnental impacts (including reduced emissions associated with allowing SUAVs for filming operations rather than full-sized aircraft, the grant of the requested exemptions is in the public interest. Accordingly, the Petitioner respectfully request that the FAA grant the requested exemption without delay.

5. Limitations and Conditions

The Petitioner proposes that the exemption requested herein be issued pursuant the limitations and conditions listed herein. These conditions/limitations provide for an even higher level of safety to operations under the current regulatory structure which apply to actual certificated aircraft because the proposed operations represent a safety enhancement to the already very safe SUAVs filming operations conducted by recreational SUAVs and conventional aircraft.

These limitations and conditions to which Aerial Imaging Systems agrees to be bound when conducting business/commercial operations under this FAA issued exemption include:

A. The SUAVs maximum take-off weight ("MTOW") will be less than 55 lbs. usually less than 25 lbs.

B. Flights will be operated within visual line of sight ("VLOS") of the operator and/or observer. Maximum total flight time for each operational flight will be 60 minutes or less. Flights will be terminated and not less than 10% battery power reserve, which should that occur prior to the 60 minute limit.

C. The operator may designate and supervise another experienced SUAV operator to operate the SUAVs subject to the supervision and direction of the operator.

D. Flights will be operated at an altitude of no more than 500 feet above ground level ("AGL") underneath navigable airspace. Minimum crew for each business operation will consist of the SUAVs operator, the visual observer/camera operator, if required for the operation. Flights will not be operated in Class A, B, C, and D airspace but may be operated in Class E and G airspace, provided the SUAVs operator/observer maintains visual line of sight with the SUAVs and safe separation form actual certificated aircraft in the airspace.

E. Briefing will be conducted in regard to the planned SUAVs operations proir to each day's production activities. It will be mandatory that all personnel who will be either operator or visual observer/camera operator be present for this briefing. The operator will review weather, flight battery requirements, landing and takeoff distances and aircraft performance data before initiation of flight. The SUAVs and batteries to be used will be safety inspected prior to flight using appropriate checklists.

F. The operator will attempt to obtain the consent of all persons involved in the filming and ensure that only consenting persons will be allowed within 25 feet of the flight operations.

G. Operator and observer/camera operator will have been trained in operation of SUAVs generally and received up-to-date information on the particular SUAVs to be operated.

H. Operator and observer/camera operator shall at all times during flight operation be in direct voice/radio communication.

I. Written and/or oral permission from the relevant property holder may be obtained. All required permissions and permits may be obtained from territorial, state, county or city jurisdictions, including local law enforcement, fire, or other appropriate governmental agencies. If the SUAVs loses communications or loses its GPS signal, the SUAV will have capability to return to home/pre-determined location within the security perimeter and land.

J. The SUAVs will have the capability to abort a flight in case of unpredicted obstacles or emergencies. The operator shall carry/use appropriate LIPO battery protective bags and fire extinguishing equipment.

K. Should any low flying/distressed manned aircraft enter the airspace they are to be given the "right-a-way" and all SUAVs are to abort there missions and land immediatly.

6. Description of Regulations Which May Apply From Which Petitioner Requests Exception 14 C.F.R. Part 21, Subpart H: Airworthiness Certificates 14 C.F.R. 91.203 (a)(1)

Subpart H, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR 91.203 (a)(1). Given the size and limited operating area associated with the SUAVs to be utilzed by the petitioner, an exemption from Part 21 Subpart H meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the FMRA. The Federal Aviation Act (49 U.S.C. 44701 (f)) and Section 333 of the FMRA both authorize the FAA to exempt aircraft from the requirement for an airworthness certificate, upon consideration of the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular SUAVs. In all cases, an analysis of these criteria demonstrates that the UAS operated without an airworthiness certificate, in the restricted environment and under the conditions proposed will be at least as safe, or safer, than a conventional aircraft (fixed wing or rotorcraft) operating with an airworthness certificate without the restrictions and conditiions proposed.

The SUAVs to be operated hereunder is less than 55 lbs. fully loaded, is by definition unmanned and carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a limited flight area. Unlike other civil aircraft, operations under this exemptiion will be tighly controlled and monitored by the operator and will also remain within the requirements of, and in compliance with, local public safety requirements. These safety enhancements, which already apply to civil aircraft provide a greater degree of safety to the public and property owners than conventional operations conducted with airworthiness certificates issued under 14 C.F.R. Part 21, Subpart H. Lastly, applications of these same criteria demonstrates that there is no credible threat to national security posed by the UAS due to its size, speed of operation, location of operation, lack of explosive materials or flammable liquid fuels, and inability to carry a substantial external load.

14 C.F.R. 45.23 (b) Marking of the Aircraft

The requlatioin require, When marks include only the Roman capital letter "N" and the regristration number is displayed on limited, restricted or light-sport category aircraft or experimental or provisioinally certificated aircraft, the operator must also display on the aircraft or experimental or

provisionally certificated aircraft, the operator must also display on the 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.

Even though the SUAVs will have no airworthiness certificate, an exemption may be needed as the SUAVs will have no entrance to the cabin, cockpit, or pilot station on which the word "Experimental" can be placed. Given the size of the SUAVs, two-inch lettering will be impossible. The word "Experimental" will be placed on the fuselage in compliance with 45.29 (f). The equivalent level of safety will be provided by having the SUAVs marked on its fuselage as required by 45.29 (f) where the pilot, observer and others working with the SUAVs will see the identification of the SUAVs as "Experimental". The FAA has issued the following exemptions to this regulations to exemptions Nos. 10700, 8738, 10167, 10167 A.

14 C.F.R. 61.113 (a) & (b): Private Pilot Privilages and Limitations: Operator.

Sections 61.113 (a) & (b) limit private pilot to non-commercial operations. Because the SUAVs is unmanned and will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations by requiring the operator operating the aircraft to have a FAA ground school course rather than a commercial pilot's license to operate the SUAVs. Unlike a conventional aircraft that carries the pilot and passengers, the SUAVs is remotely controllled with no living things on board. The area of operation is controlled and restriced, and all flights are planned and coordinated in advance. The level of safety provided by the requirements included herein exceed the provided by a single individual holding a commercial pilots certificate operating a conventional aircraft. The risks associated with the operation of the SUAVs are so diminished from the level of risk associated with commercial operations conteplated by Part 61 when drafted, that allowing operations of the SUAVs as requested with a private pilot as the operator exceeds the present level of safety achieved by 14 C.F.R. 61.113 (a) & (b).

14 C.F.R. 91.7 (a): Civil aircraft airworthiness.

The regulation requires that no person may operate a civil aircraft unless it is in airworthy condition. As there will be no airworthiness certificate issued for the aircraft, should this exemption be granted, no FAA regulatory standard will exist for determining airworthiness. Given the size of the aircraft and the requirements contained herein for the use of safety check lists prior to each flight, an equivalent level of safety will be provided.

14 C.F.R. 91.9 (b) (2): Civil Aircraft Flight Manual in the Aircraft.

Section 91.9 (b) (2) provides: No person may operate a U.S.-registered civil aircraft..

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

The SUAVs, given is size and configuration has no ability or place to carry such a filght manual on the aircraft, not only because there is no pilot on board, but because there is no room or capacity to carry such an item on the aircraft.

The equivalent level of safety will be maintained by keeping the SUAVs operation manual an appropriate checklists at the ground control point where the pilot flying the SUAVs will have immediate access to it. The FAA has issued the following exemptions to the regulation: Exemption nos 8607, 8737, 8738, 9299, 9299A, 9565, 95658, 10167, 10167A, 10602, 32827, and 10700.

14 C.F.R. 91.103: Pre-Flight Action.

This regulation requires each pilot in command to take certain actions before flight to insure the safety of flight. As FAA approved rotorcraft flight manuals will not be provided for the aircraft an exemption will be needed. An equivalent level of safety will be provided as set forth hereinabove. The operator will take all actions including reviewing weather, flight battery requirements, landing and takeoff distances and aircraft performance data before initiation of flight using appropriate checklists.

14 C.F.R. 91.109: Flight Instruction:

Section 91.103 provides 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.

SUAVs and remotely piloted aircraft, by their design do not have full functional dual controls. Flight control is accomplished through the use of a radio transmitter that communicates with the aircraft via a receiver in the SUAVs. The FAA has approved exemptions for flight traning without fully functional dual controls for a number of aircraft and for flight instructions in experimental aircraft. See exemption nos. 5778K & 9862A. The equivalent level of safety provided by the fact that neither a pilot nor passengers will be carried in the aircraft and by the size and speed of the aircraft.

14 C.F.R. 91.119: Minimum Safe Altitudes.

Sectioin 91.119 establishes safe altitudes for operation of civil aircraft. Section 91.119 (d) allows helicopters to be operated at less than the minimums prescribed, provided the person operating the helicopter complies with any route or altitudes prescribed for helicoptors by the FAA. This exemption is for a SUAVs and the exemption requests authority to operate at altitudes up to 500 AGl. underneath navigable airspace and in class E and G airspace maintaining safe separation from actual aircraft, an exemption may be needed to allow such operations.

The equivalent level of safety will be achieved given the size, weight, speed of the SUAV as well as the location where it is operated. No flight will be taken without the permission of the property owner or local officials. Because of the advance notice to the property owner and participants in the filming activity, attempts will be made to contact all affected individuals regarding the planned flight operations. Compared to flight operations with aircraft or rotorcraft weighting far more than the maximum 55 lbs. proposed herein, and the lack of flammable fuel, any risk associated with these operatin is far less than those presently presented with conventional aircraft. In addition, the low-altitude operations of the SUAVs will ensure separation between these SUAVs operations and the operations of conventional aircraft that must comply with Section 91.119.

14 C.F.R. 91.121 Altimeter Settings.

This regulation requires 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". As the SUAVs may not have a barometric altimeter, but instead a GPS altitude read out, an exemption may be needed. An equivalent level of safety will be achieved by the operator, pursuant to the Manual and Safety Check List, confirming the altitude of the launch site shown on the GPS altitude indicator before flight.

14 C.F.R. 91.151 (a): Fuel Reqirements for Flight in VFR Conditions.

Section 91.151 (a) prohibits an individual from beginning "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."

The battery powering the SUAVs provides approximately between 0 - 60 minutes of powered flight. To meet the 30 minute reserve requirement in 14 C.F.R. 91.151, SUAVs flights would be limited to approximately 10 minutes in length. Given the limitations on the SUAVs proposed flight area and the location of its proposed operations within a predetermined area, a longer fime frame for flight in daylight or night VFR conditions is reasonable.

Petitioner believes that an exemption form 14 C.F.R. 91.151 (a) falls within the scope of prior exemptions. *See* Exemption 10673 (allowing Lockheed Martin Corporation to operate without compliance with FAR 91.151 (a)). Operating the SUAVs in controlled area where only people and property owners or official representatives who have signed waivers will be allowed, with less than 30 minutes of flight operation time, does not give rise to the type of risks that Section 91.151 (a) was intended to alleviate particularly given the size and speed of the SUAVs. Additionally, limiting SUAVs flights to 20 minutes would greatly reduce the utility for which the exemption will be granted.

Petitioner believes that an equivalent level of safety can be achieved by limiting flights to 60 minutes or no less than 10% of battery power, whichever happens first. This restriction would be more than adequate to return the SUAVs to its planned landing zone from anywhere within its limited operating area. Similar exemptions have been granted to other operations, including exemptions 2689F, 5745, 10673, and 10808.

14 C.F.R. 91.203 (a) and (b): Carrying Civil Aircraft Certification and Registration.

The regulation provides in pertinent part:

(a) Except as provided in 91.715, no person may operate a civil aircraft unless is has within it the following:

(1) An appropiate and current airworthiness certificate...

(2) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

The SUAVs fully loaded weight no more than 55 lbs. and typically less than 20 lbs. and is operated without on onboard pilot. As such, there is no ability or place to carry certification and registration documents or to display them on the SUAVs.

An equivalent level of safety will be achieved by keeping these documents at the ground control point where the operator/pilot flying the SUAVs will have immediate access to them to the extent they

are applicable to the SUAVs. The FAA has issued mumerous exemptions to this regulation. A representative sample of other exceptions includes exemption Nos. 9565, 9665, 9789, 9789A, 9797, 9797A, 9816A, and 10700.

14 C.F.R. 91.405 (a); 407 (a) (1); 409 (a) (2); 417 (a) & (b): Maintenance Inspections.

These regulations require that an aircraft operator or owner "shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in part 43 of this chapter...," and others shall inspect or maintain the aircraft in compliance with part 43.

Given that these section and part 43 apply only to aircraft with an airworthiness certificate, and the requirements of pre-flight inpections required herein, these sections will not apply to the applicant. Routine and pre-flight maintenace will be accomplished by the operator. An equivalent level of safety will be achieved because these SUAVs are very limited in size and will carry a very small payload and operate only in restricted areas for limited periods of time. If mechanical issues arise the SUAVs can land immediately and given its small size poses very little risk to persons or property. the operator will ensure that the SUAVs is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance performed. Moreover the aircraft is an airworthy condition to provide the equivalent level of safety.

7. Publication Summary.

Pursuant to 14 C.F.R. Part 11, the following summary is provided for publicatin in the Federal Register, should it be determined that publication is needed:
Petitioner seek an exemption from the following rules;

14 C.F.R. Part 21, subpart H; 14 C.F.R. 45.23 (b); 14 C.F.R. 61.113 (a) & (b);91.7 (a); 91.9 (b) (2); 91.103 (b); 91.109; 91.119; 91.121; 91.151 (a); 91.203 (a) & (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2) and 91.417 (a) & (b) to operate commercially a SUAVs vechicle (55 lbs. or less) for Aerial Photography Operations.

Approval of exemptions allowing commercial operations of SUAVs for aerial photography/ inspection for the following; Business Operations: over land, water-ways, and oceans; operation over/in non-restriced National Parks, National Forests, flight in non-navigable airspace, using non-intrusive recording devices, operation in otherwise unrestricted US States/Territories will enhance safety by reducing risk. Conventional film operations, using jet or piston power aircraft, operate at extremly low altitudes, just feet from the subject being filmed, and in extreme proximity to people and structures; and present the risks associated with vehicles that weigh in the neighborhood of 4,000 lbs., carrying large amounts of jet A or other fuel. In addition such actual certificated aircraft must fly to and from the film location. In contrast, a SUAVs weighing fewer than 55 lbs. and powered by batteries rather than fuel, eliminates virtually all of that risk. The SUAVs is driven/carried to the film site, not flown. The SUAVs will carry no passengers or crew and, therefore, will not expose any crew to the risks associated with manned aircraft flights. The operation of SUAVs weighing less than 55 lbs., conducted in the strict conditions outlined above, will provide at least an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting the petitioner from the requirements of Part 21 and allowing commercial operations. these lightweight aircraft operate at slow speeds, close to the ground and in a line of sight, relatively sterile environment and are, as a result, far safer than conventional

operations conducted with actual aircraft/helicopters operating in close proximity to the ground and people.

8. Privacy

All business/commercial flights which occur over private or controlled access property will be with the property owner's prior consent and knowledge, property owner's will be given appropiate time to remove or move any and all objects that they deem valuable and do not wish to be photographed. Filming will be of people who have also consented to being filmed or otherwise have agreed to be in the area where filming will take place. Petitioner will not infringe on any individual or landowner privacy rights. Aerial Imaging Sytems does not engage in surveillance and will not be engage in law enforcement activities until leagley binding with a judicial warrant.

Limited nighttime operation may be conducted. Nighttime as defined FAR's in Section is as follows 1.1. "Night means the time between the end of evening civil twilight and the begining of morning civil twilight, as published in the American Air Almanac, converted to local time." Night operation may be conducted by the SUAVs following the guidelines above and provided such operations have sufficient lighting so that petitoner/operator maintains visual line of sight ("VLOS"). Allowing SUAVs this exemption will provide a far safer nighttime filming alternative to the full size aircraft operations.

9. Conclusion.

The FAA's purported "ban" on business/commercial Model Aircraft/SUAVs operation has actually had the current effect of causing American skies to be less safe. There are many actual certificated pilots who are exceptionally qualified to fly model aircraft/SUAVs with their model aircraft/SUAVs experience, private, commercial or ATP pilot training, licenses and instructor ratings. However, these experienced operators and licensed pilots familiar with the FAR's, airspace and safe operating procedures are currently reluctant to commercially operate model aircraft/SUAVs or be involved for fear of the FAA seeking an enforcement actions against them or the actual pilot's licenses.

Presently, during the pendency of these issues in the *Pirker* case, it defies safety or regulatory logic that according to the FAA'a current alleged "ban" on business operations of SUAVs, your average enthusiastic 12 year old, who's well meaning Father bought him a SUAVs equipped with a camera, can operate his SUAV wherever he wants and take whatever recreatinal video/pictures subject only to the suggestions of FAA AC 91-57 and yet an FAA certificated private/commercial/ATF pilot cannot be paid to use far higher quality and equipped SUAVs to take an aerial photo, search for missing person or aerially inspect a farmer's field, despite the significant improvement in safety over non-pilots operating SUAVs recreationally and real aircraft used for aerial photography.

Satisfaction the criteria provided in Section 333 of the FMRA of 2012, and requiring the SUAVs operator to have or obtain medical a certificate and an actual pilot's license and considering the small size, weight, speed, operating capablilties, limited operations in proximity to airports and populated areas and operation within visual line of sight ("VLOS") and national security - all of which provide more than adequate justification for the grant of the requested exemption allowing business/commercial operation of applicants SUAVs for aerial photography/inspection as requested herein.

Aerial Imaging Systems will provide any an all flight logs and maintenance records per the request of the Secretary/FAA administrator for an expidited processing of above exemption request. If

further assistance is needed in processing this request, or you have any other questions or concerns, please do not hesitate to contact me via email or in writing.

Scott Carlson of Aerial Imaging Sytems

cc: James Williams, FAA
Les Dorr, FAA, Allison Duquette, FAA