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

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

August 4, 2015

Exemption No. 12303
Regulatory Docket No. FAA–2015–1188

Mr. Anthony W. LaRosa
Aerial Vision Chicago, LLC
6747 North Kolmar Avenue
Lincolnwood, IL 60712

Dear Mr. LaRosa:

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 22, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Aerial Vision Chicago, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography and cinematography.

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 two comments in support of the petition made to the docket.

Airworthiness Certification

The UAS proposed by the petitioner are the DJI Inspire 1 and DJI Phantom 3.

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 Vision Chicago, 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, Aerial Vision Chicago, 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 DJI Inspire 1 and DJI Phantom 3 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

Anthony W. LaRosa - C: +1 773 701 2559 - Anthony@aerialvisionchicago.com

April 22, 2015

U. S. Department of Transportation
Docket Management System
1200 New Jersey Ave., SE
Washington, DC 20590

Re: Exemption Request Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations from 14 C.F.R. 45.23(b); 14 C.F.R. Part 21; 14 C.F.R. Part 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,
Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11, Aerial Vision Chicago, operators of Small Unmanned Aircraft SYSTEMS ("sUASs") equipped to conduct aerial photography and cinematography for commercial and residential real estate and closed-set special events, hereby applies for an exemption from the listed Federal Aviation Regulations ("FARs") to allow commercial operation of its sUASs, so long as such operations are conducted within and under the conditions outlined herein or as may be established by the FAA as requires by Section 333.

As described more fully below, the request exemption would permit the operation of small, unmanned, and redundant sUAS under controlled conditions in airspace that is 1) limited 2) predetermined 3) controlled as to access and 4) would provide safe operations and affordability to the existing real estate and closed-set special event industries currently using conventional aircraft. Approval of this exemption would thereby enhance safety, promote industry growth and fair competition through affordability of aerial photography and cinematography and fulfill the Secretary of Transportation's (the FAA Administrator's) responsibilities to "... establish requirements for the safe operation of such aircraft systems in the national airspace system." Section 333 of the Reform Act.

The name and address of the applicant is:
Aerial Vision Chicago
Attn: Anthony W. LaRosa
Ph: 773-701-2559
Email: Anthony@aerialvisionchicago.com
Address: 6747 N Kolmar Ave. Lincolnwood, IL 60712

Regulations from which the exemption is requested:
14 C.F.R. Part 21
14 C.F.R. 45.23 (b)
14 C.F.R. 61.3
14 C.F.R. 91.7 (a)
14 C.F.R. 91.9 (b) (2)
14 C.F.R. 91.103
14 C.F.R. 91.109
14 C.F.R. 91.119
14 C.F.R. 91.121
14 C.F.R. 91.151 (a)
14 C.F.R. 91.203 (a) & (b)
14 CFR § 91.205(b)
14 CFR § 91.215
14 C.F.R. 91.405 (a)
14 C.F.R. 407 (a) (1)
14 C.F.R. 409 (a) (2)
14 C.F.R. 417 (a) & (b)

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 rule making required under Section 332 of the Reform Act. In making this determination, the Secretary is required to determine which types of UASs do not create a hazard to users of the NAS or the public or pose a threat to national security in light of the following:

- The UAS's size, weight, speed and operationalcapability;
- Operation of the UAS in close proximity to airports and populatedareas; and
- Operation of the UAS within visual line of sight of the operator.

Reform Act § 333 (a). Lastly, id 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." Id. §333(c).

The Federal Aviation Act expressly grants the FAA the authority to issue exemptions. This statutory authority by its terms includes exempting civil aircraft, as the term is defined under §40101 of the Act, that includes sUASs, from the requirement that all civil aircraft must have a current airworthiness certificate.

The 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 Administrator finds the exemption in the public interest. 49 U.S.C. §44701(f) See also 49 USC §44711(a); 49 USC §44704; 14 CFR §91.203 (a) (1).

Flight Vehicle:

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Aerial Vision Chicago proposes to use two sUASs; 1) DJI Inspire 1 & 2) DJI PHANTOM 3 Advanced Both of these aircrafts has four rotors and four motors in a quadcopter configuration (X4). Both sUASs weigh less than 55 lbs. including payload. They operate, under normal conditions at a speed of no more than 50 knots and have the capability to hover, and move in the vertical and horizontal plane simultaneously. Both sUASs are equipped with GPS and auto-return function to the predetermined safe landing area as well as allowing reading of magnetic interference that can cause loss off GPS signal. The sUASs will operate only in line of sight and will operate only within a sterile closed-set area of a residential or commercial listing or a closed-set special event. Such operations will insure that the sUASs will "not create a hazard to users of the national airspace system or the public." (Reform Act Section 333 (b)).

Given the small size of the sUASs involved and the restricted sterile environment within which they will operate, the applicant 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 UASs to commence immediately.Also due to the size of the UASs and the restricted areas in which the relevant sUASs will operate, approval of the application presents no national security issue. Given the clear direction in Section 333 of the Reform Act, 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 enhanced safety, reduction in environmental impacts, including reduced emissions associated with allowing UASs for movie and television operations, the grant of the requested exemptions is in the public interest. Accordingly, the applicant respectfully requests that the FAA grant the requested exemption without delay.

AIRCRAFT AND EQUIVALENT LEVEL OF SAFETY

Aerial Vision Chicago proposes that the exemption requested herein apply to civil aircraft that have the characteristics and that operate with the limitations listed herein. These limitations provide for at least an equivalent or even higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to the already safe aerial photography and cinematography filming operations conducted with conventional aircraft.

These limitations and conditions to which Aerial Vision Chicago agrees to be bound when conducting commercial operations under an FAA issued exemption include:

- The sUAS will weigh less than 55 lbs.
- Flights will be operated within line of sight of a pilot and/or observer.
- Maximum total flight time for each operational flight will be 30 minutes or less.
- Flights will be terminated at 25% battery power reserve should that occur prior to the 30 minute limit.
- Flights will be operated at an altitude of no more than 400 feet AGL or, not more than 200 feet above an elevated platform for which filming is planned.
- Minimum crew for each operation will consist of the sUAS Pilot, the Visual Observer, and the Camera Operator.
- sUAS Pilot will also meet the flight review requirements specified in 14 C.F.R 61.56 in an aircraft in which the Pilot is rated on his or her pilot certificate.

- The sUAS will only operate within a confined sterile closed-set area with a set safety perimeter, the boundaries of which will be determined by production personnel and the sUAS PIC based on the site-specific filming activities and speed of the sUAS required for the operation, and coordinated with the jurisdictional FAA FSDO and local government officials as applicable.
- A briefing will be conducted in regards to the planned sUAS operations prior to each day's production activities. It will be mandatory that all personnel who will be performing duties within the boundaries of the safety perimeter be present for this briefing.
- The sUAS Pilot and/or Aerial Coordinator will ensure this safety perimeter that only consenting production personnel will be allowed within 100 feet of the sUAS operation by not permitting anyone who had not been briefed or whom is not involved in production to be in the closed-set area.
- Observer and PIC will at all times be able to communicate by voice and/or two way radio communication system.
- Written and/or oral permission from the relevant property holders will be obtained.
- If applicable, all required permissions and permits will be obtained from territorial, state, county or city jurisdictions, including local law enforcements, fire, or other appropriate governmental agencies.
- If the sUAS loses communications or loses its GPS signal, the sUAS will have the capability to return to a pre-determined location within the Security Perimeter and land safely.
- The sUAS will have the capability to abort flight in case of unpredicted obstacles or emergencies.

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 aircraft to be utilized by the Applicant, an exemption from Part 21 Subpart H meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act.The Federal Aviation Act (49 U.S.C.§44701 (f)) and Section 333 of the Reform Act both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular UAS. 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 airworthiness certificate without the restrictions and conditions proposed.

14 C.F.R. § 45.23 (b). Marking of the Aircraft
The regulation requires:
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.
Even though the sUAS will have no airworthiness certificate, an exemption may be needed as the sUAS will have no entrance to the cabin, cockpit or pilot station on which the word “experimental” can be placed. Given the size of the sUAS, 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 sUAS marked on its fuselage as required by §45.92 (f) where the pilot, observer and others working with the sUAS will see the identification of the sUAS as “Experimental”. The FAA has issued the following exemptions to this regulation to Exemptions Nos. 10700, 8738, 10167 and 10167A.

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 in the Manual for maintenance and use of safety check lists prior to each flight, as set forth in Sections J, L and Q, 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 ...
The sUAS, given its size and configuration has no ability or place to carry such a flight 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 flight manual at the ground control point where the pilot flying the sUAS will have immediate access to it.The FAA has issued the following exemptions to this regulation: Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10167A, 10602, 32827, and 10700.
(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.
14 C.F.R. § 91.103: Preflight 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 set forth by the pre-flight checklist as set forth in the Flight Operations Manual.The PIC will take all actions including reviewing weather, flight battery requirements, landing and takeoff distances, aircraft performance data and setting the pre-determined safe landing area in case of loss of GPS communication before initiation of flight.

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. sUASs and remotely piloted aircraft, by their design do not have fully functional dual controls. Flight control is accomplished through the use of a control box that communicates with the aircraft via radio communications.The FAA has approved exemptions for flight training without fully functional dual controls for a number of aircraft and for flight instruction 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

Section 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 helicopters by the FAA.As this exemption is for a sUAS that is a helicopter and the exemption requests authority to operate at altitudes up to 400 AGL, or not more than 200 above an elevated platform from which filming is planned, an exemption may be needed to allow such operations.The sUAS will never operate at higher than 400 AGL. It will however be operated in a restricted area with security perimeter, where buildings and people will not be exposed to operations without their pre-obtained consent.

The equivalent level of safety will be achieved given the size, weight, speed of the UAS 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, all affected individuals will be aware of the planned flight operations. Compared to flight operations with aircraft or rotorcraft weighting far more than the maximum 55lbs. proposed herein and the lack of flammable fuel, any risk associated with these operations is far less than those presently presented with conventional aircraft operating at or below 500 AGL in aerial photography and cinematography industry. In addition, the low- altitude operations of the sUAS will ensure separation between these sUAS 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 sUAS 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 Pre Flight 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 Requirements 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 sUAS provides approximately 40 minutes of powered flight. To meet the 30 minute reserve requirement in 14 CFR §91.151, sUAS flights would be limited to approximately 10 minutes in length. Given the limitations on the UAS's proposed flight area and the location of its proposed operations within a predetermined area, a longer time frame for flight in daylight or night VFR conditions is reasonable.
Aerial Vision Chicago believes that an exemption from 14 CFR §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 small UAS, in a tightly controlled area where only people and property owners or official representatives who have signed waivers will be allowed, with less than 30 minutes of reserve fuel, does not engender the type of risks that Section 91.151(a) was intended to alleviate given the size and speed of the small UAS. Additionally, limiting sUAS flights to 10 minutes would greatly reduce the utility for which the exemption will be granted.

Applicant believes that an equivalent level of safety can be achieved by limiting flights to 30 minutes or 25% of battery power whichever happens first. This restriction would be more than adequate to return the sUAS to its planned landing zone from anywhere in 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 it has within it the following:
(1) An appropriate and current airworthiness certificate. . . .
(b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under §91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.
The UAS fully loaded weighs no more than 55 lbs and is operated without an onboard pilot.As such, there is no ability or place to carry certification and registration documents or to display them on the sUAS.
An equivalent level of safety will be achieved by keeping these documents at the ground control point where the pilot flying the sUAS will have immediate access to them, to the extent they are applicable to the sUAS.The FAA has issued numerous 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, these sections will not apply to the applicant. Maintenance will be accomplished by the operator pursuant to the flight manual and operating handbook. An

equivalent level of safety will be achieved because these small UASs are very limited in size and will carry a small payload and operate only in restricted areas for limited periods of time. If mechanical issues arise the UAS can land immediately and will be operating from no higher than 400 feet AGL.The operator will ensure that the UAS is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance performed. Moreover, the operator is the person most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety.

Pursuant to 14 C.F.R. Part 11, the following summary is provided for publication in the Federal Register, should it be determined that publication is needed:

Applicant seeks an exemption from the following rules:
14 C.F.R. §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) and (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); 91.409 (a) (2) and 91.417 (a) & (b) to operate commercially a small unmanned vehicle (55lbs or less) in aerial photography and cinematography for residential and commercial real estate and closed-set special events.

Approval of exemptions allowing commercial operations of sUASs for aerial photography and cinematography for real estate and close-set special events will enhance safety by reducing risk. Conventional real estate aerial photography and cinematography use jet or piston powered aircraft which carry large amounts of combustible fuel posing increased risk. Conversely, sUASs carry no combustible fuel, weigh only 55 lbs. or less comparatively to 3,000+ lbs. of a conventional aircraft, are much more easily maneuverable and do not ferry to and from the production location. Additionally, flying at or below 400 AGL sUAS will be no factor with fixed wing and rotor wing aircraft.

The operation of small UASs, weighting less than 55 lbs., conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial operations. These lightweight aircraft operate at slow speeds, close to the ground, and in a sterile environment and, as a result, are far safer than conventional operations conducted with traditional aircraft which pose a safety risk. There are no personnel on board the sUASs and therefore the likelihood of death or serious bodily injury is significantly diminished. All flights will occur over private or controlled access property with the property owner's prior consent and knowledge. 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. Aerial Vision Chicago will provide an equivalent or better level of safety as that achieved under the current FAR's.

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Aerial Vision Chicago respectfully request that the FAA grants the exemption request. Satisfaction of the criteria provided in Section 333 of the Reform Act of 2012--size, weight, speed, operating capabilities, proximity to airports and populated areas and operation within visual line of sight and national security – provide more than adequate justification for the grant of the requested exemptions allowing commercial operation of applicant's UAS in aerial photography and cinematography for the real estate industry and close-set special events pursuant to the Manuals appended hereto.

Sincerely,

Anthony W. LaRosa
Aerial Vision Chicago, LLC.

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Appendix

FAR section	Subject	Justification
14 CFR § 45.23(b)	Requirement to display registration number on vehicle	Insufficient space on vehicle
14 CFR Part 21	Aircraft certification requirements and procedures	Designed for manned aircraft; not suitable for off-the-shelf sUAS
14 CFR § 61.3	Requirement for pilot certificate	Part 61 requirements designed for manned aircraft, not sUAS; petition describes training for sUAS operator
14 CFR § 91.7 (a)	Airworthiness requirement	Designed for manned aircraft; not suitable for off-the-shelf sUAS
14 CFR § 91.9 (b) (2)	Requirement for manual to be available in the cockpit	No one aboard to read manual
14 CFR § 91.103(b)	Requirement for crew members to be onboard	Unmanned vehicle
14 CFR § 91.109	Requirement for dual controls during flight instruction	No one aboard to operate controls
14 CFR § 91.119	Minimum altitudes for safe flight	Safety requires operation below these altitudes
14 CFR § 91.121	Altimeter settings	No one aboard to read altimeter
14 CFR § 91.151(a)	Fuel requirements	Vehicle does not use fuel
14 CFR § 91.203 (a) & (b)	Requirement for registration and airworthiness certificates to be onboard	No one aboard to read certificates
14 CFR § 91.205(b)	Cockpit instruments	No one aboard to read

	Requirement	Instruments
14 CFR § 91.215	Transponder requirement	Vehicle has insufficient useful load; will be operated below ATC radar coverage
14 CFR § 91.405 (a)	Inspection requirements	Designed for manned aircraft; not suitable for off-the-shelf sUAS
14 CFR § 91.407(a) (1)	Inspection approval requirements	Designed for manned aircraft; not suitable for off-the-shelf sUAS
14 CFR § 91.409 (a) (2)	Airworthiness inspection	Designed for manned aircraft; not suitable for off-the-shelf sUAS
14 CFR § 91.417 (a)	Maintenance records	Designed for manned aircraft; not suitable for off-the-

& (b)	requirements	shelf sUAS

DJI INSPIRE SPECS

Aircraft	**Model** T600 **Weight (Battery Included)** 2935 g **Hovering Accuracy (GPS Mode)** Vertical: 0.5 m Horizontal: 2.5 m **Max Angular Velocity** Pitch: 300°/s Yaw: 150°/s **Max Tilt Angle** 35° **Max Ascent Speed** 5 m/s **Max Descent Speed** 4 m/s **Max Speed** 22 m/s (ATTI mode, no wind) **Max Flight Altitude** 4500 m **Max Wind Speed Resistance** 10 m/s **Max Flight Time** Approximately 18 minutes **Motor Model** DJI 3510 **Propeller Model** DJI 1345 **Indoor Hovering** Enabled by default **Operating Temperature Range** -10° to 40° C **Diagonal Distance** 559 to 581 mm **Dimensions** 438x451x301 mm
Gimbal	**Model** ZENMUSE X3 **Output Power (With Camera)** Static: 9 W In Motion: 11 W **Operating Current**

	Station: 750 mA Motion: 900 mA **Angular Vibration Range** ±0.03° **Mounting** Detachable **Controllable Range** Pitch: -90° to +30° Pan: ±320° **Mechanical Range** Pitch: -125° to +45° Pan: ±330° **Max Controllable Speed** Pitch: 120°/s Pan: 180°/s
Camera	**Name** X3 **Model** FC350 **Total Pixels** 12.76M **Effective Pixels** 12.4M **Image Max Size** 4000x3000 **ISO Range** 100-3200 (video) 100-1600 (photo) **Electronic Shutter Speed** 8s – 1/8000s **FOV (Field Of View)** 94° **CMOS** Sony EXMOR 1/2.3” **Lens** 20mm (35mm format equivalent)f/2.8 focus at ∞ 9 Elements in 9 groups Anti-distortion **Still Photography Modes** Single shoot Burst shooting: 3/5/7 frames Auto Exposure Bracketing (AEB): 3/5 bracketed frames at 0.7EV Bias Time-lapse **Video Recording Modes** UHD (4K): 4096x2160p24/25, 3840x2160p24/25/30 FHD: 1920x1080p24/25/30/48/50/60 HD: 1280x720p24/25/30/48/50/60 **Max Bitrate Of Video Storage** 60 Mbps **Supported File Formats**

	FAT32/exFAT Photo: JPEG, DNG Video: MP4/MOV (MPEG-4 AVC/H.264) **Supported SD Card Types** Micro SD Max capacity: 64 GB. Class 10 or UHS-1 rating required. **Operating Temperature Range** 0° to 40° C
Remote Controller	**Name** C1 **Operating Frequency** 922.7~927.7 MHz (Japan Only) 5.725~5.825 GHz 2.400~2.483 GHz **Transmitting Distance (Outdoor And Unobstructed)** 2 km **EIRP** 10dBm@900m, 13dBm@5.8G, 20dBm@2.4G **Video Output Port** USB, mini-HDMI **Power Supply** Built-in battery **Charging** DJI charger **Dual User Capability** Host-and-Slave connection **Mobile Device Holder** Tablet or Phone **Max Mobile Device Width** 170mm **Output Power** 9 W **Operating Temperature Range** -10° to 40° C **Storage Temperature Range** Less than 3 months: -20° to 45° C More than 3 months: 22° to 28° C **Charging Temperature Range** 0-40° C **Battery** 6000 mAh LiPo 2S
Charger	**Model** A14-100P1A **Voltage** 26.3 V **Rated Power** 100 W

Battery (Standard)	**Name** Intelligent Flight Battery **Model** TB47 **Capacity** 4500 mAh **Voltage** 22.2 V **Battery Type** LiPo 6S High voltage battery **Energy** 99.9 Wh **Net Weight** 570 g **Operating Temperature Range** -10° to 40° C **Storage Temperature Range** Less than 3 months: -20° to 45° C More than 3 months: 22° C to 28° C **Charging Temperature Range** 0° to 40° C **Max Charging Power** 180 W
Battery (Optional)	**Name** Intelligent Flight Battery **Model** TB48 **Capacity** 5700 mAh **Voltage** 22.8 V **Battery Type** LiPo 6S **Energy** 129.96 Wh **Net Weight** 670 g **Operating Temperature Range** -10° to 40° C **Storage Temperature Range** Less than 3 months: -20 to 45° C More than 3 months: 22° to 28° C **Charging Temperature Range** 0° to 40° C **Max Charging Power** 180 W
Vision Positioning	**Velocity Range** Below 8 m/s (2 m above ground)

	Altitude Range 5-500 cm **Operating Environment** Brightly lit (lux > 15) patterned surfaces **Operating Range** 0-250 cm

Phantom 3 Specs

Aircraft	**Weight (Including Battery And Propellers)** 1280 g **Diagonal Size (Including Propellers)** 590 mm **Max Ascent Speed** 5 m/s **Max Descent Speed** 3 m/s **Hover Accuracy** Vertical: +/- 10cm Horizontal: +/- 1m **Max Speed** 16 m/s (ATTI mode, no wind) **Max Altitude Above Sea Level** 6000 m **Operating Temperature** 0°C to 40°C **GPS Mode** GPS/GLONASS
Camera	**Sensor** Sony EXMOR 1/2.3” Effective pixels: 12.4 M (total pixels: 12.76 M) **Lens** FOV 94° 20 mm (35 mm format equivalent) f/2.8, focus at ∞ **ISO Range** 100-3200 (video) 100-1600 (photo) **Shutter Speed** 8s -1/8000s **Image Max Size** 4000 x 3000 **Still Photography Modes** Single Shot Burst Shooting: 3/5/7 shots

	uto Exposure Bracketing (AEB): 3/5 racketed Frames at 0.7EV Bias ime-lapse **Video Recording Modes** Phantom 3 Professional HD: 4096x2160p 24/25, 3840x2160p 24/25/30 HD: 1920x1080p 24/25/30/48/50/60 D: 1280x720p 24/25/30/48/50/60 Phantom 3 Advanced HD: 1920x1080p 24/25/30/48/50/60 D: 1280x720p 24/25/30/48/50/60 **Supported SD Card Types** Micro SD Max capacity: 64 GB. Class 10 or UHS-1 rating required **Max Bitrate Of Video Storage** 60 Mbps **Supported File Formats** AT32/exFAT hoto: JPEG, DNG ideo: MP4, MOV (MPEG-4 AVC/H.264) **Operating Temperature** 0°C to 40°C
Gimbal	**Controllable Range** Pitch -90° to +30° **Stabilization** 3-axis (pitch, roll, yaw)
Vision Positioning	**Max Velocity** Less than 8 m/s (when 2 m above ground) **Altitude Range** 30 cm-300 cm **Operating Range** 30 cm-300 cm **Operating Environment** Surface with clear pattern and adequate lighting (Lux > 15)
Remote Controller	**Operating Frequency** 2.400 GHz-2.483 GHz **Max Distance** 2000m (outdoors and unobstructed) **Video Output Port** USB **Operating Temperature**

	0°C- 40°C **Battery** 6000 mAh LiPo 2S **Mobile Device Holder** For tablet or phone **Receiver Sensitivity (1%PER)** -101 dBm ±2 dBm **Transmitter Power (EIRP)** CC: 20 dBm E: 16 dBm **Working Voltage** 1.2 A @7.4 V
Battery Charger	**Voltage** 17.4 V **Rated Power** Phantom 3 Professional 00 W Phantom 3 Advanced 7 W
Intelligent Flight Battery	**Capacity** 4480 mAh **Voltage** 15.2 V **Battery Type** LiPo 4S **Energy** 68 Wh **Net Weight** 365 g **Max Flight Time** Approximately 23 minutes **Operating Temperature** -10°C to 40°C **Max Charging Power** 100 W
App / Live View	**Mobile App** DJI Pilot **EIRP** 100mW **Live View Working Frequency** 2.4GHz ISM **Live View Quality** 720P @ 30fps (depending on conditions and mobile device) **Latency**

	220ms (depending on conditions and mobile device)