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

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

July 9, 2015

Exemption No. 11998
Regulatory Docket No. FAA–2015-0331

Mr. Michael Joseph Indovina VI
Mike Six Imaging
8000 West Manchester Ave. #222
Playa Del Rey, CA 90293

Dear Mr. Indovina:

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

By letter dated March 31, 2015 you petitioned the Federal Aviation Administration (FAA) on behalf of Mike Six Imaging (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct commercial real estate and venue photography.

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 Tarot 680 Pro hexa-copter.

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, Mike Six Imaging 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, Mike Six Imaging 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 Tarot 680 hexa-copter 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 July 31, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

To Whom It May Concern:

I am a Los Angeles native, active Airline Transport Pilot, CFI and aerial photographer operating under Mike Six Imaging. This letter is written to request for an exemption to Section 333 for UAS drone filming for commercial gain with the intent to comply with all existing and future FAA Regulations under the National Airspace System.

For nearly the last eight years I have flown as a full time commercial pilot in traffic watch, flight instruction and part-135 on-demand charter operations and operated Mike Six Aerial Imaging photography business and hobby on the side. In recent word of the proposed laws regarding UAS drones I began to decide this would be a perfect addition to my work, given my training, extensive knowledge and background in this area. Having flown both remotely controlled and fixed wing aircraft at a young age gives me a strong and stable foundation in this industry as my performance has continued to develope into an instinct. Working in the system for the past decade in combination with my knowledge of the airspace, regulations and procedures I feel that I would be an ideal candidate and pilot in the eyes of the FAA with UAS drone operations. I have proven myself true in my flight career to date, I have logged more than 4,500 hours total time and hold a jet PIC rating, with not one violation of regulations or any incidents.

These recent changes for usage of remotely controlled devices for film and photography create an advantage to many, including myself, who have the background in remotely controlled aircraft operations whom also hold a pilot's license and current medical certificate. I wish to support the growth of this industry by maintaining and complying within a strongly structured business plan and FAA approval in combining my efforts with you as the system continues to grow.

Design:

My UAS system is comprised of lightweight, exceptionally strong foldable carbon fiber frame with six brushless motors with the capability of generating over 19lbs of lift. Affixed within are GPS, magnetic compass, and barometric altitude sensors with a 3-axis gyroscope to maintain stability and remotely controlled via a radio transmitter. Permanently mounted below as payload, center-ship is a Sony Nex-5 small and lightweight DSLR camera fixed on a 3-axis, self-righted camera gimbal, with a total combined weight of less than 2 pounds. The UAS ships' only purpose is to be used in still/motion framed filming, compliant within Line of Sight control, flight altitudes well below 400 feet above ground level with a total combined flight weight of 8 pounds including its twin batteries. Its flight speeds are flown very slow, much below mandated speeds of 50kts, and has four fail-safe modes: one for radio failure, one for GPS failures and 2 for battery low conditions.

To date, I have kept an extensive flight log including maintenance performance tests, removal, repair & preventative maintenance with return to service descriptions and have logged over 5 hours of flight time.

My plan is to offer a creative twist to my photography business with the usage of my personally assembled drone to capture shots, reducing the traffic load on the NAS by splitting events between the use of aircraft and my drone. My photos are intended primarily for commercial real estate and/or personally invited events, and would not in any way adversely affect or jeopardize anyone's safety. I plan to provide the level of safety standards equal to what's required under FAR parts 61 and 91. My system was designed with safety and professionalism in mind, and shows throughout my work performance.

Developmental, Operational History and Limitations:

August 2014 design, plan and construction were all carefully considered when piecing together this system. The choice of 6 power-plant motors over 4 added an extra edge and added protection from the unexpected event of a sudden, in-flight power or rotor-blade failure. The Flight Controller is manufactured by APM (3dr robotics) a vastly tested and trusted company in the industry, which contains an internal, 3-axis gyroscope for ship leveling and a barometric altitude sensor which offers altitude hold operations. The GPS antenna and on-board compass module can be used for position logging, position hold, GPS guided, and return to launch and/or failsafe operations. The flight controller also transmits pitch & roll, airspeed, altitude, magnetic heading, battery voltage, and GPS latitude & longitudinal data to the ground station for an added level of control. Fixed opposite of each other to counter-balance each others weight are 2 lipo batteries that provide up to 20 minutes of flight between swapping, and are wired in parallel to cover the event of a sudden loss of current from each other. Redundancy was at the forefront of mind in the design.

Numerous test flights of the 3 flight modes: GPS lock, Return to Launch, Altitude Hold; and failsafe operations: loss of radio control signal or low battery voltage triggering either landing or a return to the launch position and land were all meticulously and cautiously executed at a safe and controlled field. Each flight session begins with an extensive preflight inspection of all power plants, propellers and frame structure, flight mode conditions, flight data read-out display and flown only after all have been deemed satisfactory for flight, pursuant to 14 CFR section 91.7(b). A wireless connection to a base station, a separately powered Apple laptop running APM software that provides a up-to-the-second active display of the flight mode, flight attitude, ship altitude and airspeed, latitude & longitude position and battery voltage. All maintenance and repairs have, and always will be, performed by myself with compatible and/or identical parts, logged and tested prior to any subsequent flight. Again, safety is a key principle value.

Radio control is accomplished via a 2.4 GHz, pre-bound (singular bonded) signal with frequency hopping technology to prevent signal interference or interruption. A 933MHz signal is established between ground control unit (laptop & APM software) and APM controller, operated as an optional unit for the displayed flight information. All of the UAS RF signals are FCC compliant.

The PIC of this drone is myself, Michael Joseph Indovina VI, and is directly responsible for the operation of this UAS. I am an ATP Pilot with over 4,500 flight hours and hold a first class medical certificate. With this UAS, I have currently logged 49 flights, and accumulated more than 5 flight hours. Medical standards for the pilot would be such that mimic regulations for flight in aircraft under FAR parts 61 & 91.

Flight operations would include myself, a camera operator and a minimum of one flight observer to aid and assist with flight operations. Both assistants will obtain qualifications of ground instruction and a satisfactory demonstration of knowledge and performance prior to any service. The observer's primary objective will be to notify of any aircraft in the proximity to cease flight activities, and most importantly for population control to maintain a clear area in the flight environment. A quarantined area will be used for drone departures & arrivals, including all flight paths, which will be segregated from any interference as an added safety barrier. All flight operations will be controlled within close proximity of the UAS, within visual line-of-sight (VLOS) as mandated by Section 333(b)(1).

Flight times are not to exceed 15 minutes or operated below a battery voltage of 15.3, equating to landing sooner than 80% of the total available capacity and/or with a minimum of 20% battery charge (6 minutes of flight time remaining as a reserve.) Flights are never to be conducted over people or a crowd, and operated at a minimum safe altitude over objects or property as not to create a collision hazard. Flight altitudes will never be conducted above 400 feet Above Ground Level. Speeds operated will be very slow if not stationary, much slower than already limited and approved UAS ships at 50 knots. Flights will be conducted daylight conditions (sunrise to sunset.) Operations will be limited to wind conditions at or below 15 knots of velocity and will at all times maintain clear of clouds. Operations in visible moisture will be strictly prohibited. Any flight to be conducted within 5 statute miles of a controlled airport will require approval from the controlling agency prior to any flight operations.

Safety Risks and Hazards:

As with any aircraft, the primary safety risks and hazards with this UAS are with the moving propellers, injury from falling objects and a fire hazard from the electronics. Contact with the propeller while it is in motion could cause serious injuries and could require hospitalization. Camera, sensors and other objects fixed to the ship necessary for flight will be permanently mounted by metallic screws and in some

cases adhesive tape and zip-tie straps to prevent being dislodged from the ship and onto persons or property below. A minimal fire hazard could arise from an unexpected crash and contact with electrical wire or components. By carrying a class AB&C Halon fire extinguisher and a first-aid kit, fire and injury risks could be minimized and contained should these events occur. Flight operations would be tailored to meet the need to prepare, prevent and reduce the risk of these injuries or events for each flight by maintaining a clear and unobstructed area below the ship while it is in flight.

In Conclusion:

With my declaration of purpose and stated limitations within this document, I submit to you this formal request for a written exemption of Section 333 for Mike Six Imaging. In the event that this letter does not satisfy the requirements for an exemption I respectfully request any information or correspondence so that I may provide to you any omitted material. Again, it is with my utmost desire to comply within your authorization, any and all limitations placed by you to minimize the potential risks, hazards and/or unnecessary congestion to the National Airspace System where applicable, and eliminate any imposed threats to any person or property to the uninvolved. My longstanding support in the growing aviation industry will continue to build my reputation of safety, performance and reliability in the face of the FAA and the public for the growing NAS structure at the forefront of today's technology and changing times with my operations.

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