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

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

September 4, 2015

Exemption No. 12771
Regulatory Docket No. FAA-2015-1777

Mr. Brian Stanford
4012 Tennyson Street
San Diego, CA 92107

Dear Mr. Stanford:

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 24, 2015, you petitioned the Federal Aviation Administration (FAA) for an exemption. You requested to operate an unmanned aircraft system (UAS) to conduct photogrammetry, photography, cinematography, industrial inspections, search and rescue, and analyses.

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 Quanum 680UC Pro.

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

**Conditions and Limitations**

In this grant of exemption, Mr. Brian Stanford is hereafter referred to as the operator.

[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.

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 Quanum 680UC Pro 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 September 30, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

U.S. Department of Transportation
Docket Management System
1200 New Jersey Avenue, S.E.
West Building Ground Floor, Room W12-140
Washington, DC 20590

**RE: Docket ID: FAA-2014-1081**
Petition for Exemption under Section 333 of the FAA Modernization and Reform Act and Part 11.81 of the Federal Aviation Regulations

April 24, 2015

**Petitioner:**
Brian Stanford
4012 Tennyson St.
San Diego, CA 92107
Email: brian@stanfordenterprise.com

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 11.81, Brian Stanford, hereby applies for an exemption from the listed Federal Aviation Regulations ("FARs") to allow commercial operation of its small, unmanned aircraft for photogrammetry, photography/cinematography, industrial inspections, search & rescue, and analyses. All operations shall be conducted within and under the conditions and limitations outlined previously by the FAA as required by Section 333 and conducted in compliance with the attached operator's manuals.

1. Sections from which exemptions are sought: Application is hereby made for exemption from:
    a. 14 CFR Part 21, subpart H
    b. 14 CFR Part 61.113(a) and (b)
    c. 14 CFT Part 91:
        i. 91.103(b)(2)
        ii. 91.105
        iii. 91.109
        iv. 91.119
        v. 91.121
        vi. 91.151
        vii. 91.405
        viii. 91.407
        ix. 91.409
        x. 91.417

2. Relief sought:

a. Brian Stanford wishes to operate small Unmanned Aircraft Systems (sUAS) for commercial purposes to include (but not be limited to) photogrammetry, photography/cinematography, industrial inspections, search & rescue, and analyses. This relief is sought because commercial use of sUAS is currently prohibited by law unless performed under an exemption.
b. This exemption will cover use of the following airframes, all of which will weigh less than 55 pounds including payload and energy sources:
    i. Quanum 680UC Pro Multi-rotor (6-propeller hexagonal frame, carbon fiber):
        1. Total weight with maximum allowable payload: 9 lbs.
        2. Dimensions: Greatest width: 680mm (25.59in), Height (with landing gear): 305mm
        3. Maximum speed: 30kts
        4. Battery system (1x 4-cell, 14.8 volt, 15,000maH lithium-polymer) provides fifteen (15) minutes of flight time, and two (2) minutes of reserve flight time.
        5. NAZA-M Flight Controller (with GPS and compass) is installed on this sUAS, and is the most advanced system currently available, with latest firmware release.
        6. Use of First-Person View ("FPV") for advanced flight safety; provides real-time video downlink from sUAS as well as critical flight systems status to video monitor on transmitter.
    ii. HobbyKing H550 Flamewheel Multi-rotor (6-propeller hexagonal frame, plastic/metals):
        1. Total weight with maximum allowable payload: 6.5lbs
        2. Dimensions: Greatest width: 550mm (21.65in), Height (with landing gear): 10.5"
        3. Maximum speed: 30kts
        4. Battery system (4-cell, 14.8 volt, 5000maH lithium-polymer) provides eight (8) to fifteen (15) minutes of flight time, and one (1) minute of reserve for RTH function if necessary.
        5. NAZA-M Flight Controller (with GPS and compass) is installed on this sUAS, and is the most advanced system currently available, with latest firmware release.
        6. Use of First-Person View ("FPV") for advanced flight safety; provides real-time video downlink from sUAS as well as critical flight systems status to video monitor on transmitter.
    iii. Flight Controller and Fail-Safe systems:
        1. The existing flight control technology that Brian Stanford utilizes is the DJI NAZA-M Flight Controller, which provides these safety features:
            a. GPS Attitude Control: Prior to flight operation, the GPS records latitude and longitude, and that position becomes the origin of flight. Once airborne, the GPS holds the sUAS in this position, and does not deviate from it, unless the operator changes the mode. This

level of safety safeguards the sUAS, preventing it from drifting away, and posing a potential risk of injury or damage to property.

b. Attitude Control: The flight controller disables the GPS, and allows operator to control the sUAS in a manner consistent with manual flight. The onboard stability systems keep sUAS horizontally stabilized, to prevent erratic flight performance.

c. Return-to-Home ("RTH"): If the operator, under any circumstances, deems the operation of the sUAS to become a risk to persons, property, or the sUAS itself, the RTH command may be invoked, safely returning the sUAS to the origin of flight, subsequently landing and powering down autonomously. This feature is a design protocol that allows the operator to dismiss operation in the event of his or her inability to control the sUAS, as in with an emergency situation.

iv. Other models to be added by future amendment to this exemption.

3. Public benefit:
   a. Use of sUAS technology to obtain imagery, information and data currently obtained by use of manned flight or manual methods:
      i. Reduces statistical risk to human life due to manned aircraft accidents (e.g., infrastructure inspections) and due to other dangerous activities that can be avoided (e.g., scaffolding/rigging failures during stack or bridge inspections).
      ii. Reduces the cost of obtaining such information, which benefits consumers and the economy.
      iii. Reduces environmental impact by eliminating sources of hydrocarbon emissions from manned aircraft.

4. Safety not adversely affected:
   a. Aircraft will be registered and marked in accordance with Section 44711 and Part 47 and Part 45, Subpart C.
   b. Aircraft will comply with maintenance and inspection requirements of the manufacturer. All repair and maintenance work will be conducted or approved by qualified personnel such as those authorized by Robotic Skies (or equivalent), and will require a test flight after such work. Records of all maintenance and repair work will be kept in a maintenance log for each aircraft.
   c. All operations will be conducted in accordance with valid Certificates of Authorization.
   d. All flight operations will comply with the following:
      i. The manufacturers' user manuals.

ii. Flight Operations and Procedures Manual (FOPM) and Aircraft Flight Manuals (AFM), which include lost communication and other emergency and safety procedures.
iii. Conducted in VMC conditions during daylight hours.
iv. PIC will maintain VLOS at all times.
v. Pre-flight inspections (including ground control station, if any) and safety risk assessments will be conducted prior to each flight.
vi. Flight altitudes will remain below 400 feet above ground level.
vii. Flight ground speeds will not exceed 50 knots.
viii. Not intrude into Class B, C or D airspace, or published approach, SID or STAR, or take place within 5 nautical miles of an airport.
ix. Not be made near persons as required in 14 CFR 91.119 and not over persons on the ground without their prior permission.
x. Each flight will be logged in both the PIC's logbook and the aircraft logbook.
xi. Not exceed 75% of the battery or fuel capacity of the aircraft, or 30 minutes, whichever occurs first.
xii. Any incidents will be reported within 24 hours of occurrence.
xiii. Any applicable local FSDO requirements.
xiv. All other applicable regulations concerned with the operation of aircraft.

e. Aircraft will use FCC compliant 2.4 GHz for command & control of the aircraft with well-defined and tested lost link procedures.

Please advise of any additional information or changes that may be required.

Sincerely,

Brian Stanford