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

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

July 28, 2015

Exemption No. 12177
Regulatory Docket No. FAA-2015-1743

Mr. Ryan S. Eaton
Owner
Space Coast Aerial Surveillance LLC
2160 Judge Fran Jamieson Way, Apartment 113
Melbourne, FL 32940

Dear Mr. Eaton:

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 posted to the public docket on May 18, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Space Coast Aerial Surveillance LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial data collection.

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 are the Tarot 680 Pro and Tarot 960.

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, Space Coast Aerial Surveillance 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, Space Coast Aerial Surveillance 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 Tarot 680 Pro and Tarot 960 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

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, Space Coast Aerial Surveillance LLC (SCAS), operator of small Unmanned Aircraft Systems ("sUAS") to conduct aerial surveillance, cinematography and photography, hereby applies for an exemption from the listed Federal Aviation Regulations ("FARs") to allow commercial operation of its sUAS, so long as such operations are conducted within and under the conditions outlined herein or as may be established by the FAA as required by Section 333.1

As described more fully below, the requested exemption would permit the operation of sUAS under controlled conditions in airspaces that are 1) limited 2) predetermined and 3) controlled in regards to access and 4) would provide safety enhancements to the already best practices safety protocols followed by Space Coast Aerial Surveillance. Approval of this exemption would thereby enhance safety 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(c) of the Reform Act.

The name and address of the pursuant is as follows:

Ryan S. Eaton
Space Coast Aerial Surveillance LLC
2160 Judge Fran Jamieson Way APT 113
Melbourne, FL 32940
772-485-4643
info@spacecoastuas.com

Regulations from which the exemption is requested:

14 CFR Part 21
14 C.F.R. 45.23(b)
14 CFR 61.113 (a) & (b)
14 C.F.R. 91.7 (a)
14 CFR 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 CFR 91.151 (a)
14 CFR 91.203 (a) & (b)
14 CFR 91.405 (a)
14 CFR 407 (a) (1)
14 CFR 409 (a) (2)
14 CFR 417 (a) & (b)

AUTHORITY FOR EXEMPTIONS

The Federal Aviation Act expressly grants the FAA authority to issue exemptions. This statutory authority includes exempting civil aircraft, as the term is defined under §40101 of the Act, including 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 USC §44701(f). See also 49 USC §44711(a); 49 USC §44704; 14 CFR 91.203(a)(1).

Section 333(b) of the Reform Act assist the Secretary in determining whether sUASs may operate in the national airspace system without creating a hazard to the user, the public, or a threat to national security. In making this determination, the Secretary must consider:

A. The sUAS' size, weight, speed and operational capability;
B. Whether the sUAS operates within the visual line of sight of the operator;
C. Whether the sUAS operates outside of highly populated areas and away from close proximity to airports.

Reform Act 333(a). If the Secretary determines that a sUAS "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 Tarot 680 Pro is a multirotor aircraft weighing up to 10 pounds, including payload (camera and battery). Likewise, the Tarot 960 Multirotor operates at a maximum of 30 pounds, due to battery options. Both multirotors have the ability to operate under normal conditions at a speed of no more than 50 mph and has the capability to hover and move in the vertical and horizontal plane simultaneously. The sUAS will operate only in the pilot's or observer's visual line of sight at all times. Such operations will insure that the sUAS 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 sUAS involved and the restricted environment within which they will operate, our application falls squarely within the zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of sUASs to commence immediately. Also due to the small size of the UAS and the low altitudes in which our sUAS will operate, approval of the application presents no national security issue.

VEHICLE DESCRIPTION

The sUAS Space Coast Aerial Surveillance proposes are constructed from two separate classes of multirotor craft (Tarot 680 Pro and Tarot 960), each having a maximum of 6 propellers. The Tarot 680 Pro has an "all up weight" (AUW), meaning the total amount of weight with camera payload and lithium polymer batteries of 10 pounds (lbs). The Tarot 960 has an AUW with camera payload and lithium polymer batteries up to 30 pounds (lbs). Each multirotor can be operated up to a wind threshold of 35 miles per hour (mph), with gusts up to 55. Additionally, each multirotor is equipped with GPS and ground station equipment, which allows the operator to pre-program designated flight paths, respecting

defined no fly zones, legal flight ranges and altitude ceilings so the system cannot enter areas deemed unsafe or unnecessary to fly over.

Both sUAS craft maintain the ability to take full manual control at any time during semi or autonomous flight. If communication is lost with the control transmitter, regardless of semi or autonomous flight modes, the on board flight controller will immediately start a return-to-home procedure and arrive at the original source point of lift off. The same return to home feature is also configured for low battery levels and wind thresholds that exceed limits during the planned flight. Should battery become critically low during flight, the sUAS will begin a self landing procedure, while its GPS will remain online to transmit telemetry data for recovery.

All flight operations are global positioning system (GPS) controlled, making the system easy to navigate. At any point if the operator is not explicitly commanding the system to move, the system automatically holds its GPS position. The flight control system employs not only GPS positioning but a variety of sensors including sonar, barometric pressure, temperature, wind speed and others to ensure stability so long as wind thresholds are not exceeded. Also a flight termination link – to prevent a "fly away" or other potentially dangerous situation – is available to the operator.

DESCRIPTION OF SPECIFIC REGULATIONS

14 CFR Part 21, Subpart H: Airworthiness certificates

Subpart H, 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 Space Coast Aerial Surveillance, 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 USC §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 sUAS. In all cases, an analysis of these criteria demonstrates that the sUAS 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 operating with an airworthiness certificate without the restrictions and conditions proposed.

14 CFR 45.23(b): Marking of the aircraft

This regulation requires that certain experimental, provisionally certified aircraft, or light-sport category aircraft to be marked with letters between 2 inches and 6 inches high "limited", "restricted," "light-sport," "experimental," or "provisional," near each entrance to a cabin, cockpit or pilot station. Even though the UAS 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, 2 inch lettering will be impossible. Space Coast Aerial Surveillance will mark the sUAS with the organization's name and address. An insurance barcode attached to the aircraft will also be linked to Space Coast Aerial Surveillance.

14 CFR 61.113(a) & (b): Private pilot privileges and limitations: Pilot in command

Sections 61.113(a) and (b) limit private pilots to non-commercial operations. Because the sUAS will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations by requiring the pilot operating the aircraft to have completed at least 20 hours of sUAS observation time, as well as 50 hours flying a sUAS for non-commercial or government use, but

strictly as hobby use (as not to endanger civilians or property whilst learning pilot skills). Unlike a conventional aircraft that carries the pilot and passengers, the sUAS is remotely controlled with no living thing or cargo on board. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance with Space Coast Aerial Surveillance staff and the services customer, referred to as "pre-flight planning". The risks associated with the operation of the small UAS are so diminished from the level of risk associated with commercial operations contemplated by Part 61 when drafted, that allowing operations of the sUAS as requested exceeds the present level of safety achieved by 14 CFR 61.113(a) and (b).

14 CFR 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. Safety checklists will be performed to validate that an equivalent level of safety has be conducted before and after each flight.

14 CFR 91.9(b)(2): Civil aircraft flight manual, marking and placard requirements

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 User Manual at the ground control point where the pilot flying the sUAS will have immediate access to it.

14 CFR 91.103: Preflight action

This regulation requires each pilot in command take certain actions before flight to ensure the safety of flight. An exemption is needed from this requirement as the pilot will take separate preflight actions, including checking for weather conditions, checking flight battery requirements, validating GPS connectivity and fail safes, checking takeoff and landing distances, and all other actions listed in safety checklists. These actions will provide an equivalent level of safety.

14 CFR 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. By design, sUASs and remotely piloted aircraft 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 equivalent level of safety is provided by the fact that neither a pilot nor passengers will be carried in the aircraft, the ability to control the sUAS via radio signals from the controller and by the size and speed of the aircraft.

14 CFR 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. This exemption is for a multirotor craft that flies similarly to a helicopter, with vertical takeoff and vertical landing, which will typically operate at altitudes of 200 feet above ground level (AGL), so an exemption may be

needed to allow such operations. The sUAS will never operate at altitude higher than 400 AGL and all operations will occur during daylight hours under Visual Meteorological Conditions (VMC) only.

The equivalent level of safety will be achieved given the size, weight and speed of the sUAS 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 advance notice to the property owner and any onsite personnel, as well as the precautions outlined below, all affected individuals will be aware of the planned flight operations.

Flight operations will be conducted at least 500 feet from all non-participating persons (persons other than the pilot in command (PIC) or visual observer (VO)), vessels, vehicles and structures, unless:

A. Barriers or structures are present that sufficiently protect non-participating persons from debris in the event of an accident. The PIC will ensure that non-participating persons remain under such protection. If a situation arises where non-participating persons leave such protection and are within 500 feet of the sUAS, flight operations will cease immediately and/or;

B. The aircraft is operated near vessels, vehicles or structures where the land owner/controller has granted permission and the PIC has made a safety assessment of the risk of operating closer to those objects and;

C. Operations near the PIC or VO do not present an undue hazard to the PIC or VO, per 14 CFR 91.119(a).

The sUAS will remain within visual line of sight of the PIC or VO. Flight operations will be conducted at least 5 miles from an airport and at least 3 miles from any city or densely populated area. The PIC or VO will provide notification to the local Flight Standards District Office and airport controller of all operations within 5 miles of an airport. The FAA will have advance notice of all operations through the filing of notices-to-airmen.

Compared to flight operations with aircraft or rotorcraft weighing far more than the sUAS proposed herein and carrying flammable fuel, any risk associated with our operations is far less than those presently presented with helicopters and other conventional aircraft operating at or below 500 feet AGL. In addition, the low-altitude operations of the sUAS will ensure separation between these UAS operations and the operations of conventional aircraft that must comply with Section 91.119.

<u>14 CFR 91.121: Altimeter Settings</u>
This regulation requires each person operating the 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 PIC confirming the altitude of the launch site shown on the GPS altitude indicator before flight.

<u>14 CFR 91.151(a): Fuel requirements for flight in VFR conditions</u>

Section 91.151(a) outlines fuel requirements for beginning a flight in VFR conditions. Our sUAS is limited to operations in controlled environments and has a limited flight time which require an exemption from 14 CFR 91.151(a).

The battery powering the sUAS provides approximately 25 minutes of powered flight. This would render the sUAS unable to meet the 30 minute reserve requirement in 14 CFR 91.151. Given the limitations on the sUAS's proposed flight area and the location of its proposed operations within a predetermined area, a longer time frame for flight in daylight VFR conditions is reasonable.

An equivalent level of safety can be achieved by limiting flights to 20 minutes, or enough battery reserve to ensure that the sUAS lands at the ground station with at least 20% of battery power (as determined by the onboard monitoring system and the PIC), 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.

14 CFR 91.203(a) & (b): Carrying civil aircraft certification and registration

The sUAS has no cabin, cockpit or pilot station and is operated without an onboard pilot. Therefore, 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.

14 CFR 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 sections and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply to Space Coast Aerial Surveillance. Maintenance will be accomplished by the operator pursuant on an as needed basis, subject to validation after each flight. An equivalent level of safety will be achieved because these sUAS 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 sUAS can land immediately and will be operating from no higher than 400 feet AGL. The operator pursuant will ensure that the sUAS is in working order prior to initiating flight, validate all post flight checks are inversely performed from preflight checks, perform required maintenance of sUAS and additional ground station equipment 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.

PUBLIC INTEREST

Granting the present Petition will further the public interest by allowing Space Coast Aerial Surveillance LLC to safely, efficiently, and economically perform aerial video and photography of special events, film sets, and landscape over certain areas of the United States. sUAS Visual Observers are also Certified Protected Species Observers. Additionally, use of the Tarot T680/T960 UAS will reduce risk to older conventional methods of aerial surveying, reduce pollution and decrease congestion of the NAS. Notably, the benefits of Space Coast Aerial Surveillance LLC's proposed operation of the Tarot T680/T960 UAS will be realized without implicating any privacy issues.

Conducting aerial acquisitions with the Tarot T680/T960 UAS, instead of manned aircraft, will greatly benefit the public by drastically reducing the levels of air and noise pollution generated during traditional aerial video and still photography flight operations. By using battery power and electric motors, the Tarot T680/T960 sUAS produce no air pollution, and is the most viable environmentally conscious alternative to the cabin class, six cylinder internal combustion engine aircraft that are typically utilized for aerial video and photography, while burning approximately 20-30 gallons per hour of leaded aviation fuel. The Tarot T680/T960, while reducing the carbon footprint of aerial acquisitions, also eliminates noise pollution, as the UAs are propelled by battery powered electric motors, rather than an internal combustion engine.

By using the Tarot T680/T960 UAS to perform aerial acquisitions, the substantial risk to life and property in the air and on the ground, which is usually associated with traditional manned aircraft flight operations, will be substantially reduced or completely eliminated. Aside from the lack of flight crew members located onboard the aircraft, the Tarot T680/T960 has less physical potential for collateral damage to life and property on the ground, and in the air, compared to the manned aircraft that typically conduct similar operations (weighing approximately 6,000 pounds with a wingspan of approximately 42 feet, a length of 34 feet, and a fuel capacity of 180 gallons).

By reducing the number of manned aircraft operating in the NAS, congestion around airports caused by arriving and departing aircraft will be reduced. Likewise, a reduction of manned aircraft conducting aerial video and photography missions would result in fewer aircraft that must be handled by air traffic control during the ground, takeoff, departure, arrival, and landing phases of flight operations.

The visual observers (VO) that will be participating in Space Coast Aerial Surveillance's operations are certified Protected Species Observers. In addition to providing visual awareness and observations respective to sUAS operations, it is the VO's responsibility to report any observations that are deemed life-threatening to a protected or critically endangered species to the corresponding local wildlife agencies as well as Federal agencies.

EQUIVALENT LEVEL OF SAFETY

Space Coast Aerial Surveillance LLC operates Tarot T680/T960 professional grade multirotors in its inventory of sUAS. These limitations provide for at least an equivalent or even higher level of safety to operations under the regulator structure because the proposed operations are enhancements to already safe protocols defined for aerial survey operations regarding helicopters and other conventional aircraft.

Space Coast Aerial Surveillance sUASs will abide and adhere to the following limitations during all operations under an FAA issues exemption:

1. The maximum weight of proposed sUAS will weigh less than 55 pounds.
2. Minimum crew for each operation will consist of the sUAS pilot (Pilot-in-Command) and Visual Observer (VO).

3. PIC will hold either a private or sport pilot certificate
4. Observer and pilot will at all times be able to communicate verbally
5. Flights will be operated within visual line of sight (VLOS) of the UAS pilot and aircrew (Spotter/Observer)
6. Maximum total flight time is limited to 30 minutes, during daylight only. Flights will be terminated at 25% battery power reserve should that occur prior to the 30 minute limit.
7. The pilot and visual observer will have been trained in the operation of the sUAS
8. Flights will be operated at an altitude of no more than 400 feet AGL or, not more than 200 feet above an elevated platform from which filming is planned.
9. Flight operations will be conducted 5 nautical miles from an airport and at least 3 statute miles from any city or densely populated area.
10. Flight operations will not proceed when wind conditions exceed 20 mph consistently
11. Proposed sUAS will have a governed top speed of 50 mph
12. Proposed sUAS will be equipped with GPS fail safes, programmed to avoid restricted Airspaces and No-Fly zones
13. Proposed sUAS will return to home on radio control signal loss if sustained for more than 10 seconds
14. Proposed sUAS will have the capability to abort flight in case of unpredicted obstacles or emergencies.
15. Written and/or oral permission from the relevant property holders will be obtained
16. The operator will submit a written Plan of Activities to the FSDO three days before the proposed shoot as required in Section E and F of the Manual.
17. The sUAS PIC is required to have and maintain an active Academy of Model Aeronautics (AMA) membership.

PRIVACY

All flights will occur over private or controlled access property with the property owner's prior consent and knowledge. Images taken will be of individuals who have also consented to being filmed or otherwise have agreed to be in the area where aerial photography will take place.

FEDERAL REGISTER SUMMARY

Ryan S. Eaton, Aerial Surveyor and Cinematographer, Space Coast Aerial Surveillance LLC, 2160 Judge Fran Jamieson Way APT 113, Melbourne, Florida 32940 petitioned the FAA on behalf of Space Coast Aerial Surveillance LLC, (Space Coast Aerial Surveillance) for an exemption from part 21 and §§ 45.23(b), 61.113(a) and (b), 91.7(a), 91.9(b)(2), 91.103, 91.109, 91.119, 91.121,91.151(a), 91.203(a) and (b), 91.405(a), 407(a)(1), 409(a)(2), 417(a) and (b) of Title 14, Code of the Federal Regulations (14 CFR). The exemption would allow commercial operation of T680 Pro and T960 small Unmanned Aircraft Systems (sUAS) for aerial surveillance and observations, cinematography and photography.

CONCLUSION

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 Space Coast Aerial Surveillances' sUAS for aerial surveys, cinematography and photography.

My intent is to expand into a new and emerging market that utilizes sUAS in ways that not only reduce risk of human life and injury, but to also expand into already existing surveillance fields, such as protected species observation for off-shore and terrestrial species, as well as teach the value and effectiveness of sUAS use to the general public. I have been flying model aircraft and sUAS since 2008, closely following all FAA and AMA negotiations regarding sUAS and have abided by the rules as a hobbyist accordingly. I thank you for your consideration of the requested exemptions and look forward to the future integration of sUAS in the NAS. I am currently pursuing my Sport Pilot License, however until such time that I attain my said certificate, the PIC will be hired friend who holds a Private Pilot License.

If you require any additional information, or if I can be of assistance in clarification of items in this document, please contact me immediately.

Very Respectfully,

Ryan S. Eaton
Space Coast Aerial Surveillance LLC
Owner/Operator, Aerial Surveyor and Cinematographer