



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

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

July 30, 2015

Exemption No. 12244
Regulatory Docket No. FAA-2015-2027

Mr. Chad T. Cody
Greenville Drone, LLC
2 Dapple Grey Court
Simpsonville, SC 29680

Dear Mr. Cody:

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 May 18, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Greenville Drone, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial videography and cinematography.

See Appendix A for the petition submitted to the FAA describing the proposed operations and the regulations that the petitioner seeks an exemption.

The FAA has determined that good cause exists for not publishing a summary of the petition in the Federal Register because the requested exemption would not set a precedent, and any delay in acting on this petition would be detrimental to the petitioner. However, the FAA received two comments in support of the petition made to the docket.

Airworthiness Certification

The UAS proposed by the petitioner is a DJI Inspire 1.

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 collection¹. 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, Greenville Drone, 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, Greenville Drone, LLC is hereafter referred to as the operator.

Failure to comply with any of the conditions and limitations of this grant of exemption will be grounds for the immediate suspension or rescission of this exemption.

1. Operations authorized by this grant of exemption are limited to the DJI Inspire 1 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.nts.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

Greenville Drone, LLC, Simpsonville, SC - Section 333 Exemption Petition

May 18, 2015

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

Re: Exemption Request Section 333 of the FAA Reform Act of the Federal Aviation Regulations from 14 C.F.R. 45.23(b); 14 C.F.R. Part 21; 14 C.F.R. 61.113(a)&(b); 91.7(a); 91.9(b) (2); 91.103(b); 91.109; 119.121; 91.151(a); 91.203(a)&(b); 91.405(a); 91.407(a) (1); 91.409(a) (2); 91.417(a)&(b)

Dear Sir or Madam:

I Chad Cody, Owner and operator of Greenville Drone, LLC, am writing pursuant to the FAA Modernization and Reform Act of 2012 and the procedures contained within 14 C.F.R. 11, to request that Greenville Drone, LLC, owner and operator of small unmanned aircraft, be exempted from the Federal Aviation Regulations ("FARs") listed below so that Greenville Drone, may operate small ultra light weight unmanned aircraft system ("UAS") commercially in airspace regulated by the Federal Aviation Administration ("FAA").

The requested exemption would permit the operation of small, unmanned and UAV's under controlled conditions in airspace that is 1) limited 2) predetermined 3) Controlled as to access.

As described herein, Greenville Drone, LLC has over 30 + years of experience with flying, building and safely operating recreational RC airplanes and helicopters. Greenville Drone LLC, has studied, built and repaired small and large commercial UAV's over the past 17 months. I have a high level of knowledge and respect for industry along with safety. My sole UAV is the DJI Inspire 1. My choice for this UAV is the advanced safety systems that the DJI Inspire offers and with the exclusive set up with the combined flight systems, Flight Data Log systems and camera system, which allows safe, use for aerial videography/cinematography. This will enhance academic community awareness for those individuals and companies unfamiliar with the geographical layout of the Upstate South Carolina area, and augment real estate listing videos; following exemption and approval by the FAA. Thereby enhancing their academic research experience for the Upstate South Carolina area.

Having flown small RC airplanes and helicopters for over ten (30) years without incident. Committed to safety with each flight. Greenville Drone, LLC, exemption request would permit operation of ultra lightweight, unmanned (piloted by remote control) and comparatively inexpensive UAS(s) in tightly controlled and limited airspace. Predetermined in areas away from general public, airports, heliports and vehicular traffic for community videos, and within property boundaries for individual homeowner real estate listing videos/photos. Currently, unmonitored amateur hobbyists with no safety plan or controls in place to prevent catastrophe legally operate similar lightweight, remote controlled UAS's.

I have developed my own personal operating procedures that I believe far exceeds the standards in place at this time. My objective is to prevent public hazards and well as manned aircraft / catastrophe.

This will act to further provide safe protocols exclusive to lightweight UAS's specific to real estate video and photography usage as Greenville Drone, LLC, record flight data and other information gained through permitted flight operations to share with the FAA through any required FAA reports to assist with future protocol and safety regulation.

The name and address of the applicant is:

Greenville Drone, LLC
Attn: Chad T Cody
Email ccody@greenvilledrone.com
2 Dapple Grey Ct
Simpsonville, SC 29680
864-616-0316

Regulations from which the exemption is requested:

14 C.F.R. Part 21
14 C.F.R. 45.23 (b)

14 CFR 61.113(a);

14 C.F.R. 91.7 (a)
14 C.F.R. 91.9 (b) (2)
14 C.F.R. 91.103
14 C.F.R. 91.109
14 C.F.R. 91.119
14 C.F.R. 91.121
14 C.F.R. 91.151 (a)
14 C.F.R. 91.203 (a) & (b)
14 C.F.R. 91.405 (a)

14 C.F.R. 407 (a) (1)
14 C.F.R. 409 (a) (2)
14 C.F.R. 417 (a) & (b)

This exemption application is expressly submitted to fulfill Congress' goal in passing

Section 333(a) through (c) of the Reform Act. This law directs the Secretary of Transportation to consider whether certain unmanned aircraft systems may operate safely in the national airspace system (NAS) before completion of the rulemaking required under Section 332 of the Reform Act. In making this determination, the Secretary is required to determine which types of UAV do not create a hazard to users of the NAS or the public or pose a threat to national security in light of the following:

- The UAV size, weight, speed, and operational capability;
- Operation of the UAV in close proximity to airports and populated areas; and
- Operation of the UAV within visual line of sight of the operator

Reform Act § 333(a). Lastly, if the Secretary determines that such vehicles "may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft in the national airspace system." Applicant interprets this provision to place the duty on the Administrator to not only process applications for exemptions under section 333, but for the Administrator to craft conditions for the safe operation of the UAS, if it should be determined that the conditions set forth herein do not fulfill the statutory requirements for approval. The Federal Aviation Act expressly grants the FAA the authority to issue exemptions. This statutory authority by its terms includes exempting civil aircraft, as the term is defined under § 401.01 of the Act that includes UAV, from the requirement that all civil aircraft must have a current airworthiness certificate.

The Administrator may grant an exemption from a requirement of a regulation prescribed under subsection (a) or (b) of this section or any sections 44702-44716 of this title if the

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

Greenville Drone's UAV's consist of manufacturer built 4 engine multirotor craft, weighing 55 or fewer lbs. including payload. They operate, under normal conditions, at a speed of no more than 50 knots and have the capability to hover, and move in the vertical and horizontal plane simultaneously. They will operate only in line of sight and will operate only within a small controlled area described

in the Confidential Operations Procedures, attached as Exhibit A (hereinafter "Procedures") Such operations will insure that the UAV will "not create a hazard to users of the national airspace system or the public."

Applicant submits this Procedure as a Confidential and Proprietary document under 14

CFR 11 .35 (b) as the entire Procedures contains proprietary information that the applicant has not and will not share with others. The Procedures contains operating conditions and procedures that are not available to the public and are protected from release under the Freedom of Information Act 5 USC 552 et.seq. Given the small size of the UAV's involved and the restricted controlled environment within which they will operate, the applicant falls squarely within that zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of UAV's to commence immediately. Also due to the size of the UAV's and the controlled areas in which the relevant UAV's will operate, approval of the application presents no national security issue. Given the following, the grant of the requested exemptions is clearly in the public interest:

- Clear direction in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, as amended
- The level of safety surrounding the proposed operations that implement the use of HD and thermal imaging, and the significant public benefit
- Innovative reductions in physical dangers of personnel climbing towers (e.g., thermal imaging of active wasp/hornet nests, electrical "hot spots"...) and/or the use of high-rise heavy equipment thus reduced emissions associated with allowing UAV's operations.

Accordingly, the applicant respectfully requests that the FAA grant the requested exemption without delay.

AIRCRAFT AND EQUIVALENT LEVEL OF SAFETY

The applicant proposes that the exemption requested herein apply to civil aircraft that have the characteristics and that operate with the limitations listed herein. These limitations provide for an exceptional level of safety to operations. These limitations and conditions to which Greenville Drone agrees to be bound when conducting commercial operations under an FAA issued exemption include:

DJI Inspire 1 unmanned aircraft is designed to hover in place via GPS and operate in less than a 13 knot (15 mph) wind.

For safety, stability and fear of financial loss, I will not fly in winds exceeding 13 knot (15 mph).

Built in safety systems include a GPS mode that allows my UAS to hover in place when radio controls are released.

With three programmable flights modes to choose from, I utilize the Safe Mode for aerial videography/photography. This is the safest, most reliable and stable mode to prevent accident and hazard.

When pilot communication is lost UAS is designed to slowly descend to point of take off.

No UAS operations near airports, Hospitals nor Police heliports, and do not operate near areas where general public is within fifty to one hundred (50-100) yards depending on location, conditions and weather.

I am constantly on alert for any manned aircraft (Police/Medical helicopters, etc.) and prepared to land/abort immediately to the nearest and safest ground point should a manned aircraft approach my location or If I suspect manned aircraft may approach near my location.

My UAS is capable of vertical and horizontal operations, and is flown only within my line of sight of my location, as the remote control pilot.

Utilizing battery power rather than combustible fuels, flights generally last between ten (10) to fifteen (15) minutes, with an altitude under three hundred (300) feet

- DJI Inspire UAS weighs less than 7 pounds complete with gimbal and high resolution camera system including battery system;
- I only operate my UAS below 350 feet (well within the 400 foot permissible ceiling set by the FAA Modernization and Reform Act of 2012);
- My UAS only operates for 10-15 minutes per flight;
- I land my UAS prior to manufacturer recommended minimum level of battery power;
- I pilot my UAS through remote control only by line of sight, and with ground control spotter if and when needed for additional safety;
- My UAS has GPS a flight safety feature whereby it hovers and then slowly lands

if communication with the remote control pilot is lost;

- I actively analyze flight data and other sources of information to constantly update and enhance safety protocols;
- I only operate in reasonably safe environment that are strictly controlled, are away from power lines, elevated lights, airports and actively populated areas;
- I conduct extensive pre-flight inspections and protocol, during which safety carries primary importance;
- I always obtain all necessary permissions prior to operation; and, I have procedures in place to abort flights in the event of safety breaches or potential danger.

14 C.F.R. Part 21, Subpart H: Airworthiness Certificates 14 C.F.R. §91.203 (a) (1)

Subpart H, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR §91.203 (a) (1).

Given the size and limited operating area associated with the aircraft to be utilized by the

Applicant, an exemption from Part 21 Subpart H meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act. The Federal Aviation Act (49 U.S.C. §44701 (f)) and Section 333 of the Reform Act both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular UAV. In all cases, an analysis of these criteria demonstrates that the UAV operated without an airworthiness certificate, in the restricted environment and under the conditions proposed will be at least as safe, or safer, than a conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate without the restrictions and conditions proposed.

The UAV's to be operated hereunder is less than 55 lbs. fully loaded, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a controlled area as set out in the Procedures. Unlike other civil aircraft, operations under this exemption will be tightly controlled and monitored by the operator, pursuant to the Procedures requirements. Lastly, application of these same criteria demonstrates that there is no credible threat to national security posed by the UAV, due to its size, speed of operation, location of operation, lack of explosive materials or flammable liquid fuels, and inability to carry a substantial external load.

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

The regulation requires that no person may operate a civil aircraft unless it is in airworthy condition. As there will be no airworthiness certificate issued for the aircraft, should this exemption be granted, no FAA regulatory standard will exist for determining airworthiness.

Given the size of the aircraft and the requirements contained in the Procedures for maintenance and use of safety checklists prior to each flight, an equivalent level of safety will be provided.

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

Section 91.9(b)(2) provides:

No person may operate a U.S.-registered civil aircraft...

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

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

The equivalent level of safety will be maintained by keeping the flight manual at the ground control point where the operator flying the UAV will have immediate access to it. The

FAA has issued the following exemptions to this regulation: Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 95658, 10167, 10167A, 10602, 32827, and 10700.

14 C.F.R. § 91.103: Preflight action

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

14 C.F.R. §91.109: Flight instruction:

Section 91.103 provides that no person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls.

UAV's and remotely piloted aircraft, by their design do not have fully functional dual controls. Flight control is accomplished through the use of a control box that communicates with the aircraft via radio communications. The FAA has approved exemptions for flight training without fully functional dual controls for a number of aircraft and for flight instruction in experimental aircraft. See Exemption Nos.5778K & 9862A. The equivalent level of safety provided by the fact that neither a pilot nor passengers will be carried in the aircraft and by the size and speed of the aircraft.

14 C.F.R. §91.119: Minimum safe altitudes

Section 91.119 establishes safe altitudes for operation of civil aircraft. Section 91.119 (d) allows helicopters to be operated at less than the minimums prescribed, provided the person operating the helicopter complies with any route or altitudes prescribed for helicopters by the FAA.

As this exemption is for a UAV that is a helicopter and the exemption requests authority to operate at altitudes up to 400 AGL, an exemption may be needed to allow such operations.

As set forth herein, except for the limited conditions stated in the Procedures, the UAV will never operate at higher than 400 AGL.

The equivalent level of safety will be achieved given the size, weight, and speed of the UAV as well as the location where it is operated. In addition, the low-altitude operations of the UAV will ensure separation between these small-UAS operations and the operations of conventional aircraft that must comply with Section 91.119.

14 C.F.R. §91.121 Altimeter Settings

This regulation requires each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set " ... to the elevation of the

departure airport or an appropriate altimeter setting available before departure." As the UAV may not have a barometric altimeter, but instead a GPS altitude read out, an exemption may be needed. An equivalent level of safety will be achieved by the operator, pursuant to the Procedures and Safety Check list, confirming the altitude of the launch site shown on the GPS altitude indicator before flight.

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

Section 91 .151 (a) prohibits an individual from beginning "a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing, and, assuming normal cruising speed - (1) During the day, to fly after that for at least 30 minutes; or (2) At night, to fly after that for at least 45 minutes."

In ideal conditions the battery powering the UAV provides approximately 40 minutes of powered flight. To meet the 30-minute reserve requirement in 14 CFR §91 .151, UAV flights would be limited to approximately 10 minutes in length. Given the limitations on the UAV's proposed flight area and the location of its proposed operations within a predetermined area, a longer time frame for flight in daylight or night VFR conditions is reasonable.

Applicant believes that an exemption from 14 CFR §91 .151 (a) falls within the scope of prior exemptions. See Exemption 10673 (allowing Lockheed Martin Corporation to operate without compliance with FAR 91.151 (a)). Operating the small UAS, in a tightly controlled area, with less than 30 minutes of reserve fuel, does not engender the type of risks that Section 91 .151 (a) was intended to alleviate given the size and speed of the small UAS. Additionally, limiting UAV flights to 10 minutes would greatly reduce the utility for which the exemption will be granted.

Applicant believes that an equivalent level of safety can be achieved by limiting flights to 15 minutes or 15% of battery power whichever happens first. This restriction would be more than adequate to return the UAV to its planned landing zone from anywhere in its limited operating area.

Similar exemptions have been granted to other operations, including Exemptions 2689F, 5745, 10673, and 10808.

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

The regulation provides in pertinent part:

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

(1) An appropriate and current airworthiness certificate.

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

The UAV fully loaded weighs no more than 55 lbs and is operated without an on board pilot. As such, there is no ability or place to carry certification and registration documents or to display them on the UAV.

An equivalent level of safety will be achieved by keeping these documents at the ground control point where the operator flying the UAV will have immediate access to them, to the extent they are applicable to the UAV. The FAA has issued numerous exemptions to this regulation. A representative sample of other exceptions includes Exemption Nos. 9565, 9665, 9789, 9789A, 9797, 9797A, 9816A, and 10700.

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

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

Given that these section and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply to the applicant. The operator will accomplish maintenance pursuant to the flight manual and operating handbook as referenced in the Procedures. An equivalent level of safety will be achieved because these small UAV's are very limited in size and will carry a small payload and operate only in controlled areas for limited periods of time. If mechanical issues arise the UAV can land immediately and will be operating from no higher than 400 feet AGL. As provided in the Procedures, the operator will ensure that the UAV is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance performed. Moreover, the operator is the person most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety.

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

Applicant seeks an exemption from the following rules:

14 C.F.R. §21, subpart H; 14 C.F.R 45.23(b); 14 C.F.R. §§ 61.113(a) & (b); 91.7(a); 91.9(b) (2); 91.103(b); 91.109; 91.119; 91.121; 91.151(a); 91.203(a) and (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); 91.409 (a) (2) and 91.417 (a) & (b) to operate commercially a small unmanned vehicle (551bs or less) for the purpose of inspection, monitoring, mapping and photographing attached equipment and engineering studies involving communication tower operations.

Approval of exemptions allowing commercial operations of UAV's will create a level of safety by reducing risk. For example: Conventional tower structure inspections and associated tasks involve extreme risks to personnel physically climbing such structures and/or utilizing high rise equipment both of which create numerous and extreme risk to such personnel. In contrast, a UAV weighing fewer than 55 lbs. and powered by batteries eliminates virtually all of that risk. The UAV will carry no passengers or crew and, therefore, will not expose personnel to any of the risks described above.

The operation of small UAV's, weighing less than 55 lbs., conducted in the strict conditions outlined above, will provide a level of safety supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial operations. These lightweight aircraft operate at slow speeds, close to the ground, and in a controlled environment.

All flights will occur over private or controlled access property with the property owner's prior consent and knowledge.

The granting of this exemption request will provide innovative safety operations.

Satisfaction of the criteria provided in Section 333 of the Reform Act of 2012-- size, weight, speed, operating capabilities, proximity to airports and populated areas and operation within visual line of sight and national security - provide more than adequate justification for the grant of the requested exemptions allowing commercial operation of applicant's UAV in and pursuant to the Procedures appended hereto.

Respectfully,

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