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

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

May 15, 2015

Exemption No. 11600
Regulatory Docket No. FAA–2015–0527

Mr. Alexander Traversa
Bartram Trail Surveying, Inc.
1501 Country Road 315, Suite 106
Green Cove Springs, FL 32043

Dear Mr. Traversa:

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

By letter dated March 2, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Bartram Trail Surveying, Inc. (hereinafter petitioner or operator) for an exemption. The exemption would allow the petitioner to operate an unmanned aircraft system (UAS) to conduct aerial imaging, surveying, and mapping.

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 DJI Phantom FC40.

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. 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, Bartram Trail Surveying, Inc. 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, Bartram Trail Surveying, Inc. 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 Phantom FC40 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 5 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 May 31, 2017, unless sooner superseded or rescinded.

Sincerely,

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

March 2, 2015
U.S. Department of Transportation
Docket Management System
1200 New Jersey Ave., SE
Washington, DC 20590

Dear Sir or Madam

Attached please find Bartram Trail Surveying, Inc.'s (BTS) request for an exemption from the listed Federal Aviation Regulations to allow commercial operation of its Small Unmanned Aircraft Systems ("sUASs") for aerial imaging, for safe and efficient surveying, and mapping of secured and controlled vacant and under-development sites. The exemption request is exclusively for the use of the sUASs and technology manufactured by DJI, an international manufacturer of sUASs headquartered in Shenzhen, China.

Also attached to this letter is the DJI Phantom FC40 Flight Manual ("Manual"), which outlines the operating requirements, limitations, and technical specifications for the DJI system as well as its accessories. BTS has reviewed the DJI Manual and its online resources and has found it to be acceptable for sUAS operations on secure project sites. Applicant submits this Manual as proprietary information pursuant to 14 CFR 11.35(b).

Thank you for your time and consideration, and please let me know if you have any questions.

Sincerely,

Adam Desguin
Chief Operations Officer
Bartram Trail Surveying, Inc.
1501 CR 315 Suite #106
Green Cove Springs , FL 32043
(904)284-2224 ext. 142
Adesguin@bartramtrail.net

March 2, 2015
U.S. Department of Transportation
Docket Management System
1200 New Jersey Ave., SE
Washington, DC 20590

Re:
Exemption Request Pursuant to Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations, Seeking Exemption from 14 C.F.R. Part 21; 14 C.F.R. § 45.23(b); 14 C.F.R. § 45.27; 14 C.F.R. §§ 61.113(a) and (b); 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(c); 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. § 91.407(a)(1); 14 C.F.R. §§ 91.409(a)(1) and (2); 14 C.F.R. §§ 91.417(a) and (b).

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11, Bartram Trail Surveying, Inc. (“BTS”), a land surveying, planning and consulting firm, hereby applies for an exemption from the listed Federal Aviation Regulations ("FARs") to allow commercial operation for its Small Unmanned Aircraft Systems (“sUASs”) for safe, efficient and up-to-date aerial imaging of secured and controlled vacant and under-development sites, 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.

As detailed in this document and the attached Flight Manual, the requested exemption would permit the operation of sUAS under acceptable conditions in airspace that is: limited, predetermined, controlled as to access, and would provide an increased level of safety to the best practices already demonstrated by BTS at each of its sites. 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."

The Name and Address of the applicant is:

Bartram Trail Surveying, Inc.
Attn: Alexander Traversa
Ph: (904)284-2224
Email: zantraversa@bartramtrail.net
Address: 1501 County Road 315, Suite 106
Green Cove Springs, FL 32043

Regulations from which the exemption is requested:

14 CFR Part 21
14 C.P.R. 45.23(b)
14 CFR 61.113 (a) & (b)
14 C.P.R. 91.7 (a)
14 CFR 91.9 (b)(2)
14 C.P.R. 91.103
14 C.P.R. 91.109
14 C.P.R. 91.119
14 C.P.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)

1. Statutory Authority for Exemptions

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

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 sUASs 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 sUAS's size, weight, speed, and operational capability
- Operation of the sUAS in close proximity to airports and populated areas; and
- Operation of the sUAS within visual line of sight of the operator.

Reform Act Section 333 (a). Lastly, if the Secretary determines that such operations "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).

BTS's sUASs are electricity powered, multirotor vehicles, weighing fewer than 10lbs. including payload. They operate under normal conditions at speeds of no more than 25 knots and have the capability to hover, and move in the vertical and horizontal plane simultaneously. The sUAS will operate only in the line of sight at all times and will operate only within the sterile area described and pre-established before all flights as outlined in the attached DJI Manual. 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 sUASs involved and the restricted 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 sUAS to commence immediately. Also due to the size of the sUAS and the restricted areas in which the relevant sUAS will operate, approval of the application presents no national security issue. Given the clear direction in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, as amended; the strong equivalent level of safety surrounding the proposed operations, and the significant public benefit, including reliable and up-to-date aerial imagery, enhanced safety for surveyors and associated contractors, and reduction in environmental impacts, including reduced emissions. Exemptions associated with allowing the commercial use of sUAS in the public interest. Accordingly, the applicant respectfully requests that the FAA grant the requested exemption without delay.

2. Public Interest

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. By granting an exemption the FAA will fulfill Congress' intent of allowing sUAS to operate with significant safety precautions in low risk environments.

The use of sUASs in surveying, aerial imaging and mapping can significantly increase the quality and accuracy of site surveys and would reduce the cost compared to conventional methods of aerial imaging. Larger more conventional aircraft are potentially hazardous due to their size, combustible fuel, and emission of hazardous pollutants. Switching to the use of sUASs would increase the safety of workers and the public.

Additionally use of sUASs would also allow greater access to densely vegetated or impassable areas. Conventional imaging is limited due to the size of the vehicles used and the height of surrounding vegetation. UASs would allow for greater precision in imagery that would require an AGL too low for conventional aircrafts.

Lastly use of sUASs at vacant sites and under-development sites can reduce the risk of injury by eliminating the need for a large number of workers in a potentially hazardous environment. There are innumerable risks in almost every work place, and especially in the surveying and construction fields. The implementation of sUASs can reduce the number of injuries and fatalities on these hazardous sites.

3. Equivalent Level of Safety

BTS proposes that the exemption requested herein apply to civil aircraft that have the characteristics and that operate with the limitations listed herein. These limitations provide for at least an equivalent or even higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to the already safe protocols followed on construction sites and imaging and surveying operations conducted with helicopters and other conventional aircraft.

BTS will be bound by the following limitations when conducting its sUAS operation under an FAA issued exemption:

1. The sUAS will weigh less than 10 lbs.

2. Flights will be operated within line of sight of the Pilot.

3. Maximum total flight time for each operational flight will be 10 minutes for multirotor. Flights will be terminated at 25% battery power reserve should that occur prior to the 10 minute limit.

4. Flights will be operated at an altitude of 200ft and no more than 400 feet AGL.

5. Minimum crew for each operation will consist of the sUAS Operator who will maintain VLOS with the sUAS at all times.

6. sUAS operators will be trained in flight, operations, and safety procedures as detailed in the Flight Manual

7. The SUAS will only operate within a confined "sterile area" as defined in the manual. It requires the establishment of a "Security Perimeter" for the flight operations area.

8. A briefing will be conducted in regard to the planned sUAS operations prior to each day's production activities. It will be mandatory that all personnel that will be performing duties within boundaries of the safety perimeter be present for this briefing.

9. All onsite personnel will consent to the sUAS flyover on site by waiver, and the operator will obtain additional verbal or written consent of all persons who will be allowed within 100ft of the flight operation.

10. The operator will submit a written Plan of Activities for each site.

11. The operator will have been trained in the operation of sUAS generally and received up-to-date information on the particular UAS to be operated.

12. Written and/or oral permission from the relevant property holders will be obtained.

13. All required permissions and permits will be obtained from territorial, state, county, or city jurisdictions, including local law enforcement, fire, or other appropriate government agencies.

14. If the sUAS loses communications or it loses its GPS signal, the sUAS will have capability to return to a pre-determined location within the Security Perimeter and land.

15. The SUAS will have capability to abort flight in case of unpredictable obstacles or emergencies.

4. Description of Specific Regulations

14 C.F.R. Part 21, Subpart H: Air worthiness certificates 14 C.F.R. Section 91.203 (a) (1)

Subpart H, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR Section 91.203 (a) (1). Given the size and limited operating area associated with 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 both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability, 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 a restricted environment and under the conditions proposed will be at least as safe, or safer, than conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate without the retractions and conditions proposed.

The sUAS to be operated here under is less than 10 lbs. fully loaded, carries neither a pilot nor passenger, carries no explosive materials or flammable materials liquid fuels, and operates exclusively within a secured area as set out in Manual. Like other civil aircraft, operations under this exemption will be tightly controlled and monitored by the operator, pursuant to the Manual's requirements, and under the requirements and in compliance with local public safety requirements, to provide security for the area of operation as is currently done on active construction sites. The FAA will have advance notice of all operations.

These safety enhancements, which already apply to civil aircraft operated in connection to motion picture and television production, provide a greater degree of safety to public and property owners than conventional operations conducted with airworthiness certificates issued

under 14 C.P.R. Part 21, Subpart H. Lastly, application of these same criteria demonstrates that there is no credible threat to national security posed by the sUAS, 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. Section 45.23 (b). Marking of the Aircraft

The regulation requires:
When marks include only the Roman capital letter "N" and the registration of the number is displayed on limited, restricted or in a light-sport category aircraft or experimental or provisionally certified aircraft, the operator must also display on the aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "light spot," "experimental," or "provisional," as applicable.

Even though the sUAS will have no airworthiness certificate, and 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, the two inch lettering will be impossible. The word "experimental" will be placed on the fuselage in compliance with §45.29 (f).

The equivalent level of safety will be provided by having the sUAS marked on it fuselage as required by §45.29 (f) where the operator, observer and others working with the sUAS will see the identification of the sUAS as "Experimental." The FAA has issued the following exemptions to this regulation to exemptions to this regulation to Exemptions Nos. 10700, 8738, 10167A.

14 C.F.R. § 61.113 (a) & (b): Private pilots Privileges and Limitations: Pilot in Command.

Sections 61.113 (a) & (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 PIC operating the aircraft to have logged 50 hours of flight experience along with 200 take-offs and 200 landings with a DJI sUAS before flying at a site, rather than have a commercial pilot’s license to operate this small sUAS. Unlike a conventional aircraft that carries a pilot and passengers, the sUAS is remotely controlled with no living thing onboard. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance. The level of safety provided by the requirements included in the manual exceeds that provided by a single individual holding a commercial pilot's certificate operating a conventional aircraft. The risks associated with the operation of the sUAS are so diminished from the level of risk associated with the operation of a commercial operations contemplated with Part 61 when drafted, that allowing operations of the sUAS as requested with a pilot who has met the minimum requirements outlined in the Manual and has logged a sufficient number of flights exceeds the present level of safety achieved by 14 C.P.R. §61,113 (a) & (b).

14 C.P.R. §91.7 (a): Civil Aircraft Airworthiness.

The regulation requires that no person may operate a civil aircraft unless it is in airworthy condition. As there will be no airworthiness certificate issued for the aircraft, should this exemption be granted, no FAA regulatory standard will exist for determining airworthiness. Given the size of the aircraft and the requirements contained in the manual for maintenance and use of safety check lists prior to each flight, as set forth in the manual and equivalent level of safety will be provided.

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

The sUAS, given its size and configuration has no ability or place to carry such a flight manual on the aircraft, not only because there is no pilot onboard, 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 sUAS will have access to it. The FAA has issued the following exemptions to this regulation: Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10602, 32827, and 10700.

14 C.F.R. § 91.103: Preflight action

This regulation requires each pilot in command to take certain actions before flight to insure the safety of the flight. An exemption is needed from this requirement as the pilot will take all actions including reviewing weather, flight battery requirements, landing and takeoff distances and aircraft performance data and all other actions outlined in the Flight Manual, before initiation of flight. These actions will provide an equivalent level of safety.

14 C.F.R. §91.109: Flight instruction

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

sUASs and remotely controlled aircraft, by their design do not have fully functioning 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 functioning 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 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 operations 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 the sUAS that flies similarly to a helicopter and the exemption requests authority to operate at altitudes of up to 400 AGL, or not more than 200 above an elevated platform from which filming is planned, an exemption is may be needed to allow such operations. As set forth by herein, except for the limited conditions stated in the Manual, the sUAS will never operate higher than 400 AGL. It will however be operated in a restricted area with a security perimeter, where buildings and people will not be exposed to operations without their pre-obtained consent.

The equivalent level of safety will be achieved given the size, weight, speed of the 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 of the advance notice to the property owner and participants in the filming activity, all affected individuals will be aware of the planned flight operations as set forth in the Manual. Compared to flight operations with aircraft or rotorcraft weighing far more than the maximum 55lbs. proposed herein and the lack of flammable fuel, any risk of associated with these operations is far less than those presently presented with conventional aircraft operating at or below 500 AGL in the surveying and mapping industry. In addition, the low-altitude operations of the sUAS will ensure separation between these small SUAS operations and the operations of conventional aircraft that must comply with Section 91.119.

14 C.F.R. §91.121 Altimeter Settings

This regulation requires each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "...to the elevation of the departure airport or an appropriate altimeter setting available before departure." As the sUAS may not have a barometric altimeter, but instead a GPS altitude read out, an exemption may be needed. An equivalent level of safety will be achieved by the operator, pursuant to the Manual 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 and individual from beginning "a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing, and assuming normal cruising speed -(1) During the

day, to fly after that for at least 30 minutes; or (2) At night, to fly after that for at least 45 minutes."

The battery powering the sUAS provides approximately 15 minutes of powered flight. To compensate the 30 minute reserve requirement in 14 CFR §91.151, sUAS flights would be limited to approximately 10 minutes in length or 25% battery, whichever comes first, which would allow for a third of its battery power for emergency use. 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 or night VFR conditions is reasonable.

BTS believes that an exemption from 14 CFR (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 sUAS, in a tightly controlled area where only people and property owners or official representatives who have signed waivers will be allowed, with less than 30 minutes of reserve fuel, does not engender the type of risk that Section 91.151 (a) was intended to alleviate given the size speed of the small sUAS. Additionally, limiting sUAS flights to 10 minutes would greatly reduce the utility for which the exemption will be granted.

BTS believes that an equivalent level of safety can be achieved by limiting flights to 10 minutes or 25% of battery power, whichever happens first. This restriction would be more than adequate to return the sUAS to its 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 cockpit entrance so that it is legible to passengers or crew.

The sUAS fully loaded weighs no more than 10lbs and is operated without an onboard pilot. As such, there is no ability or place to carry certification and registration documents or display them on the sUAS.

An equivalent level of safety will be achieved by keeping these documents at the ground control point where the pilot flying the sUAS will have immediate access to them; to the extent

they are applicable to the sUAS. The FAA has issued numerous exemptions to this regulation. A representative sample of other exemptions includes Exemption Nos. 9565, 9665, 9789, 9789A, 9797, 9816A, 10700.

14 C.F.R. §91.405 (a); 407 (a) (2); 417 (a) & (b)

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 BTS. Maintenance will be accomplished by the operator pursuant to the flight manual and operating handbook as referenced in the Manual. An equivalent level of safety will be achieved because these small 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. As provided in the Manual, the operator will ensure that the sUAS is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance preformed. 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.R45.23 (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) and 91.417 (a) & (b) to operate commercially a small unmanned vehicle (10 lbs or less) in the Surveying and 3d Mapping Service Operations.

Approval of exemptions allowing commercial operations of sUASs in the surveying and 3d mapping/scanning industry will enhance safety by reducing risk. Conventional operations using jet or piston aircraft operate at extremely low altitudes just feet from the equipment and structures; and present the risks associated with vehicles that weigh in the neighborhood of 3,000-5,000 lbs., carrying large amounts of jet A or other fuel in most cases helicopters operating with 140 gallon fuel tanks. The sUAS will carry no passengers or crew and, therefore, will not expose them to the risks associated with manned aircraft flights.

The operations of small sUASs, weighing less than 55 lbs., conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the Part 21 and allowing commercial operations. These lightweight sUASs operate at slow speeds, close to the ground and in a restricted environment, as a result, are far safer than conventional operations conducted with a piston and or turbine aircraft operating close to the ground.

Public Acknowledgement/Privacy

All Flights will occur only once the property owner has authorized operations to be conducted. 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.

Satisfaction of the criteria provided in Section 333 of the Reform Act of 2012-size, weight, speed, operating capabilities, proximity to populated areas and or close proximity to airports and operations within visual line of sight provides more than adequate justification for the grant of the requested exemptions allowing commercial operation of applicant's sUAS in the Surveying and 3D mapping service operations.

Sincerely,

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