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

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

July 30, 2015

Exemption No. 12243
Regulatory Docket No. FAA–2015–2032

Ms. Michelle Urlacher
GeoStabilization International, LLC
543 31 Road
Grand Junction, CO 81504

Dear Ms. Urlacher:

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 GeoStabilization International, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial acquisitions and research.

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 3.

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 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, GeoStabilization International, 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, GeoStabilization International, 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 Phantom 3 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

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, DC

Regulatory Docket No. _____

IN THE MATTER OF THE PETITION FOR EXEMPTION OF:
GEOSTABILIZATION INTERNATIONAL, LLC
FOR AN EXEMPTION SEEKING RELIEF FROM THE REQUIREMENTS OF TITLE 14 OF THE CODE OF FEDERAL REGULATIONS SECTIONS 61.113(a) & (b), 91.7(a), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), AND 91.417(a) & (b) CONCERNING COMMERCIAL OPERATION OF THE
DJI PHANTOM 3 UNMANNED AIRCRAFT SYSTEM
PURSUANT TO SECTION 333 OF
THE FAA MODERNIZATION AND REFORM ACT OF 2012 (PUBLIC LAW 112-95)

Submitted on May 18, 2015

GeoStabilization
International, LLC
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Grand Junction, CO 81504
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GLOSSARY OF ABBREVIATIONS

AGL	Above Ground Level
AOI	Area of Interest
ATC	Air Traffic Control
ATO	Air Traffic Organization
AV	Aerial Vehicle
C.F.R.	Code of Federal Regulation
COA	Certificate of Authorization
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
GCS	Ground Control Station
NAS	National Airspace System
NOTAM	Notice to Airmen
PIC	Pilot In Command
Section 333	FAA Modernization and Reform Act of 2012 (FMRA) Section 333
SOP	Standard Operating Procedures
UA	Unmanned Aircraft
UAS	Unmanned Aircraft System
VFR	Visual Flight Rules
VLOS	Visual Line of Sight
VMC	Visual Meteorological Conditions
VO	Visual Observer

SUMMARY

GeoStabilization International, LLC. seeks exemption from the requirements of 14 C.F.R. §§ 61.113(a) & (b), 91.7(a), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b), to operate an Unmanned Aircraft System pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA). This exemption will permit GeoStabilization International, LLC to operate an Unmanned Aircraft System (UAS) for the commercial purpose of conducting aerial acquisitions and research within the National Airspace System (NAS).

INTRODUCTION AND INTERESTS OF THE PETITIONER

GeoStabilization International, LLC (hereinafter referred to as "GSI") is focused on providing solutions for utilizing unmanned aircraft to safely and efficiently collect data that is precise, accurate, and timely. GSI's mission is to use unmanned aircraft to simplify and increase the effectiveness of data collection for the purpose of more efficient and effective imaging and classification of geohazards in order to better understand and design better mitigation strategies for geotechnical hazards throughout the United States that threaten infrastructure (roads, pipelines, homes, etc)

As set forth in this Petition, GSI seeks to commercially operate its DJI PHANTOM 3 UAS within the NAS for the purpose of conducting aerial acquisitions and research for geotechnical hazards.

BACKGROUND

Unmanned Aircraft System: DJI PHANTOM 3

GSI seeks an exemption to operate the DJI PHANTOM 3 UAS, for compensation or hire within the National Airspace System ("NAS"). The DJI PHANTOM 3 UAS is comprised of an

unmanned aircraft (UA) and a remote controller. The DJI PHANTOM 3 UA has a maximum net weight of approximately 1,280g, while having a diagonal size (including propellers) 590 mm. The DJI PHANTOM 3 UA is equipped with four propellers driven by a 6000 mAh LiPo 25 battery.

The DJI PHANTOM 3 UA that will be operated by GeoStabilization International, LLC will be registered in accordance with 49 U.S.C. 44103, *Registration of Aircraft*, as well as 14 C.F.R. Part 47, *Aircraft Registration*.

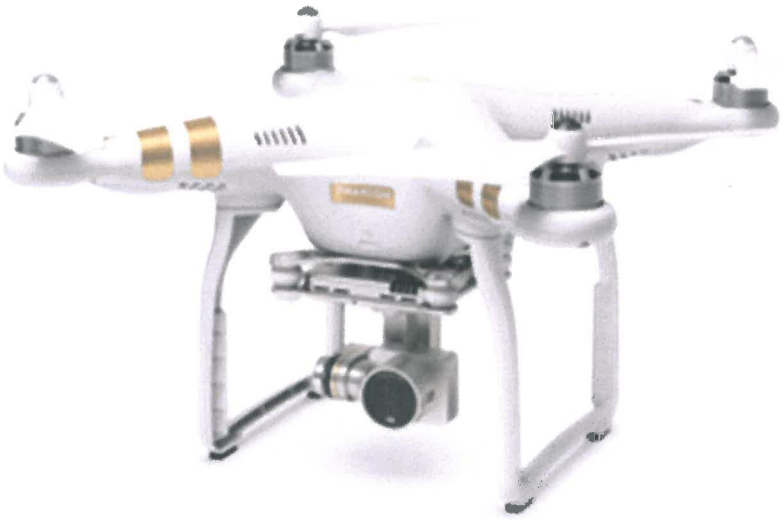

Figure 1: The DJI PHANTOM 3 UA.

BASIS FOR PETITION

Petitioner, GeoStabilization International, LLC pursuant to the provisions of the Federal Aviation Regulations (14 C.F.R. § 11.61) and the FAA Modernization and Reform Act of 2012,

Section 333, *Special Rules for Certain Unmanned Aircraft Systems*, hereby petitions the Administrator to operate the DJI PHANTOM 3 UAS within the National Airspace System (NAS), and for an exemption from the requirements of 14 C.F.R. §§ 61.113(a) & (b), 91.7(a), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).

In consideration of the size, weight, speed, and limited operating area associated with the unmanned aircraft and its operation, GSI's operation of the DJI PHANTOM 3 UAS meets the conditions of Section 333 and will not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H.

Therefore, GSI requests relief from Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), 91.417(a) & (b), as these sections set forth requirements for maintenance that only apply to aircraft with an airworthiness certificate.

GSI submits that the requested relief is proper since an equivalent level of safety will be ensured GSI will use its technicians to perform maintenance, alterations, or preventive maintenance on the unmanned aircraft system using the methods, techniques, and practices prescribed in the manufacturer's maintenance manual. Furthermore, GSI will document and maintain all maintenance records for the DJI PHANTOM 3 UAS.

Relief from certain requirements of Section 61.113(a) and (b), entitled *Private pilot privileges and limitations: Pilot in command*, is requested by GSI to the extent necessary to a qualified GSI employee or consultant who has completed the DJI PHANTOM 3 UAS training, to conduct the proposed UAS operations. GSI's UAS program will be overseen and supervised by employee licensed private pilots, who will provide initial internal GSI-UAS Operations Certification training as well as ongoing oversight and continuing education and training regarding flight and operations protocol consistent with their training. GSI submits that the conditions and limitations set forth herein will ensure the safety of the NAS, as well as the safety of persons or property on

the ground.

GSI seeks relief from Section 91.7(a), entitled *Civil aircraft airworthiness*, because the DJI PHANTOM 3 UAS does not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H. As such, GSI submits that it will ensure that the DJI PHANTOM 3 UAS is in an airworthy condition, prior to every flight, by determining that the UAS is in compliance with the DJI PHANTOM 3 UAS Operator Manual and that the UAS is in condition for safe flight.

GSI also seeks an exemption from the requirements of Section 91.121, entitled *Altimeter Settings*, because the altitude reporting equipment of the DJI PHANTOM 3 UAS is set to a pressure level of zero feet above ground level (AGL), rather than local barometric pressure or field altitude, before each flight. A level of safety equivalent to Section 91.121 will be ensured as the altitude of the DJI PHANTOM 3 UA will be reported to air traffic control (ATC) in feet AGL, and GSI will operate the DJI PHANTOM 3 UA within visual line of sight, at or below 400 feet AGL.

GSI also seeks an exemption from the requirements of Section 91.151(a)(1), *Fuel requirements for flight in VFR conditions*. GSI submits that safety will not be affected by terminating flights of the battery powered DJI PHANTOM 3 UA after 13 minutes of continuous operation, with 10 minutes remaining battery power.

In accordance with 14 C.F.R. § 11.81, GSI provides the following information in support of its petition for exemption:

A. Name And Address Of The Petitioner.

The name and address of the Petitioner is:

GeoStabilization International, LLC
543 31 Rd
Grand Junction, CO 81504

The point of contact for this Petition and specific contact information is as follows:

Michelle Urlacher
GeoStabilization International, LLC
543 31 Rd
Grand Junction, CO 81504
Tel: (970) 210-6170 | Fax: (970) 245-7737

Email: Michelle@gsi.us

THE SPECIFIC SECTIONS OF 14 C.F.R FROM WHICH GEOSTABILIZATION INTERNATIONAL, LLC SEEKS EXEMPTION

1. GSI Seeks Exemption From The Requirements Of Section 61.113(a) And (b).

Section 61.113, entitled *Private pilot privileges and limitations: Pilot in command*, subsections (a) and (b) prescribe the following, in part:

(a) No person who holds a private pilot certificate may act as a pilot in command (PIC) of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as PIC of an aircraft.

(b) A private pilot may, for compensation or hire, act as PIC of an aircraft in connection with any business or employment if—

(1) The flight is only incidental to that business or employment; and

(2) The aircraft does not carry passengers or property for compensation or hire.

2. GSI Seeks Exemption From The Requirements Of Section 91.7(a).

Section 91.7, entitled *Civil aircraft airworthiness*, subsection (a), states the following:

(a) No person may operate a civil aircraft unless it is in an airworthy condition.

3. GSI Seeks Exemption From The Requirements Of Section 91.121.

Section 91.121, entitled *Altimeter settings*, subsection (a), states the following, in relevant part:

(a) Each person operating an aircraft shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to an altimeter that is set, when operating--

(1) Below 18,000 feet MSL, to--

(i) The current reported altimeter setting of a station along the route and within 100 nautical miles of the aircraft;
(ii) If there is no station within the area prescribed in paragraph (a)(1)(i) of this section, the current reported altimeter setting of an appropriate available station; or

(iii) In the case of an aircraft not equipped with a radio, the elevation of the departure airport or an appropriate altimeter setting available before departure;

4. GSI Seeks Exemption From The Requirements Of Section 91.151(a)(1).

Section 91.151, entitled *Fuel requirements for flight in VFR conditions*, subsection (a)(1), states the following:

(a) No person may begin 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 15 minutes[.]

5. GSI Seeks Exemption From The Requirement Of Section 91.405(a). Section 91.405, entitled *Maintenance required*, subsection (a), states the following: Each owner or operator of an aircraft—

(a) 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[.]

6. GSI Seeks Exemption From The Requirements Of Section 91.407(a)(1).

Section 91.407, entitled *Operation after maintenance, preventive maintenance, rebuilding, or alteration*, subsection (a)(1), states the following:

(a) No person may operate any aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless--

(1) It has been approved for return to service by a person authorized under § 43.7of this chapter[.]

7. GSI Seeks Exemption From The Requirements Of Sections 91.409(a)(1) And 91.409(a)(2).

Section 91.409, entitled *Inspections*, subsection (a), states the following:

Except as provided in paragraph (c) of this section, no person may operate an aircraft

unless, within the preceding 12 calendar months, it has had;

(1) An annual inspection in accordance with part 43 of this chapter and has been approved for return to service by a person authorized by § 43.7 of this chapter; or

(2) An inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.

8. GSI Seeks Exemption From The Requirements Of Sections 91.417(a) And 91.417(b).

Section 91.417, entitled *Maintenance records*, subsections (a) and (b), state the following:

(a) Except for work performed in accordance with §§ 91.411 and 91.413, each registered owner or operator shall keep the following records for the periods specified in paragraph (b) of this section:

(1) Records of the maintenance, preventive maintenance, and alteration and records of the 100-hour, annual, progressive, and other required or approved inspections, as appropriate, for each aircraft (including the airframe) and each engine, propeller, rotor, and appliance of an aircraft. The records must include--

(i) A description (or reference to data acceptable to the Administrator) of the work performed; and

(ii) The date of completion of the work performed; and

(iii) The signature, and certificate number of the person approving the aircraft for return to service.

(2) Records containing the following information:

(i) The total time in service of the airframe, each engine, each propeller, and each rotor.

(ii) The current status of life-limited parts of each airframe, engine, propeller, rotor, and appliance.

(iii) The time since last overhaul of all items installed on the aircraft which are required to be overhauled on a specified time basis.

(iv) The current inspection status of the aircraft, including the time since

the last inspection required by the inspection program under which the aircraft and its appliances are maintained.

(v) The current status of applicable airworthiness directives (AD) and safety directives including, for each, the method of compliance, the AD or safety directive number and revision date. If the AD or safety directive involves recurring action, the time and date when the next action is required.

(vi) Copies of the forms prescribed by § 43.9(d) of this chapter for each major alteration to the airframe and currently installed engines, rotors, propellers, and appliances.

(b) The owner or operator shall retain the following records for the periods prescribed:

(1) The records specified in paragraph (a)(1) of this section shall be retained until the work is repeated or superseded by other work or for 1 year after the work is performed.

(2) The records specified in paragraph (a)(2) of this section shall be retained and transferred with the aircraft at the time the aircraft is sold.

(3) A list of defects furnished to a registered owner or operator under § 43.11 of this chapter shall be retained until the defects are repaired and the aircraft is approved for return to service.

B. The Extent Of Relief GSI Seeks And The Reason GSI Seeks The Relief.

1. Extent of Relief GSI Seeks And The Reason GSI Seeks Relief From Section 61.113(a) And (b).

Relief from Section 61.113(a) and (b), entitled *Private pilot privileges and limitations: Pilot in command*, is requested to the extent necessary to allow a PIC who has completed the Phantom 3 UAS training requirements, to conduct the proposed UAS flight operations for compensation.

This relief is requested since the limitations set forth in Section 61.113(a) and (b) state that a private pilot may, for compensation or hire, act as PIC of an aircraft in connection with any business or employment if: (1) The flight is only incidental to that business or employment; and

The aircraft does not carry passengers or property for compensation or hire.

As set forth more fully below, GSI submits that an equivalent level of safety will be maintained because no PIC will be allowed to operate the DJI PHANTOM 3 UAS unless that PIC has demonstrated, through the DJI PHANTOM 3 UAS training requirements, that the PIC is able to safely operate the DJI PHANTOM 3 UAS in a manner consistent with the operations specifications as described in this exemption, including evasive and emergency maneuvers, as well as maintaining appropriate distances from people, vessels, vehicles and structures.

Further, GSI submits that all flights of the DJI PHANTOM 3 UAS, conducted by the PIC pursuant to the grant of this Petition will be: (1) incidental to GSI's business; and (2) not carry passengers or property for compensation or hire.

2. Extent of Relief GSI Seeks And The Reason GSI Seeks Relief From Section 91.7(a).

Relief from Section 91.7(a), entitled *Civil aircraft airworthiness*, is requested to the extent required to allow GSI to determine that the DJI PHANTOM 3 UAS is in an airworthy condition prior to every flight by ensuring that the UAS is in compliance with the DJI PHANTOM 3 UAS Operator Manual and that the UAS is in condition for safe flight. Copies of the manuals, which contain proprietary information, are attached hereto as Exhibits A. respectively, and are to be held in a separate file pursuant to 14 C.F.R. § 11.35(b) .

GSI seeks the requested relief because the DJI PHANTOM 3 UAS does not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H. Therefore, GSI will ensure that the DJI PHANTOM 3 UAS is in an airworthy condition based upon its compliance with the operating documents prior to every flight, and as stated in the conditions and limitations below.

3. Extent Of Relief GSI Seeks And The Reason GSI Seeks Relief From Sections

91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).

Since Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b) only apply to aircraft with an airworthiness certificate, GSI requests relief from these Sections because the DJI PHANTOM 3 UAS does not require an airworthiness certificate. As set forth more fully below, the DJI PHANTOM 3 UAS meets the conditions of Section 333 for operation without an airworthiness certificate. Accordingly, GSI will use technicians to perform maintenance, alterations, or preventive maintenance on the unmanned aircraft system using the methods, techniques, and practices prescribed in the manufacturer's maintenance manual. Furthermore, GSI will document and maintain all maintenance records for the DJI PHANTOM 3 UAS.

C. The Reasons Why Granting GSI's Request Would Be In The Public Interest; That Is, How It Would Benefit The Public As A Whole.

Granting the present Petition will further the public interest by allowing GSI to safely, efficiently, and economically perform aerial acquisitions and research within the NAS, commercially, in support of researching geotechnical hazards, which threaten public and private infrastructure. Additionally, use of the DJI PHANTOM 3 UAS will decrease congestion of the NAS, reduce pollution, and provide significant benefits to the economy. Notably, the benefits of the proposed operation of the DJI PHANTOM 3 UAS will be realized without implicating any privacy issues.

1. The Public Will Benefit From The Aerial Acquisition And Research Performed.

GSI submits this Petition to commercially operate the DJI PHANTOM 3 UAS and perform aerial acquisition and research within the NAS, in support of government entities, transportation departments, agriculture, scientific studies, wildlife monitoring, forestry, mining, and the oil

and gas industries. The DJI PHANTOM 3 UAS will provide safe, efficient, and economical aerial acquisition and research operations to further identify geotechnical hazards of which are critical to the well-being of the general public.

The specific operations that GSI will perform with the DJI PHANTOM 3 UAS demonstrate how the requested exemption will directly benefit the above-referenced industries and the public. The DJI Phantom 3 will be used to reach previously inaccessible areas to image and map potential geotechnical risks to the public. The DJI Phantom will give our crew the safe approach of being able to monitor potential landslides, rockfall areas and other potential geohazard situations that are a potential risk to the public.

2. The Public Will Benefit From Decreased Congestion Of The NAS.

The DJI PHANTOM 3 UA is battery powered and serves as a safe, efficient, and economical alternative to the manned aircraft traditionally utilized to obtain aerial imagery. By reducing the amount of manned aircraft needed to perform aerial acquisitions, an exemption allowing the use of a DJI PHANTOM 3 UAS would reduce the amount of manned aircraft in the NAS, reduce noise and air pollution, as well as increase the safety of life and property in the air and on the ground.

Furthermore, by reducing the number of manned aircraft operating in the NAS, congestion around airports caused by arriving and departing aircraft will be reduced. The DJI PHANTOM 3 UA does not require an airport to takeoff or land. Likewise, a reduction of manned aircraft conducting aerial survey 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.

3. The Public Will Benefit From The Safety And Efficiency Of The DJI PHANTOM 3 UAS.

Conducting aerial acquisitions with the DJI PHANTOM 3 UAS, instead of manned aircraft, will greatly benefit the public by drastically reducing the levels of air and noise pollution generated during traditional aerial survey flight operations. By using battery power and an electric motor, the DJI PHANTOM 3 UAS produces no air pollution, and is the most viable environmentally conscious alternative to the cabin class, six cylinder internal combustion twin engine aircraft that are typically utilized for aerial acquisitions, while burning approximately 20-30 gallons per hour of leaded aviation fuel. The DJI PHANTOM 3 UA, while reducing the carbon footprint of aerial acquisitions, also eliminates noise pollution, as its battery powered electric motor is barely audible during the take-off phase, and cannot be heard when operating more than 100 feet above ground level.

By using the DJI PHANTOM 3 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 aircrew members located onboard the aircraft, the DJI PHANTOM 3 UA(weighing approximately 1,280g at its maximum gross weight with a Diagonal Size 590mm, with no fuel on board), 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 aerial acquisitions (weighing approximately 6,500 pounds with a wingspan of approximately 40 feet, a length of 34 feet, and a fuel capacity of 180 gallons).

Furthermore, by using the DJI PHANTOM 3 UAS to perform aerial acquisitions of potential geotechnical risks to the public we are able to quickly, and efficiently access emergency situations and develop a design-build approach to remedy such geohazard risks.

4. Performing Aerial Acquisition Operations With The DJI PHANTOM 3 UAS Will Benefit The Economy.

In addition to being safe and efficient, the DJI PHANTOM 3 UAS is also an economical alternative to using manned aircraft to conduct aerial acquisitions. As such, operation of the DJI PHANTOM 3 UAS will allow United States based companies, like GSI, to remain competitive and contribute to growth of the U.S. economy. Specifically, with the rising cost of aviation fuel and the Environmental Protection Agency ("EPA") regulatory actions phasing out leaded fuels, U.S. owned and operated companies must adopt new and alternative technology in order to remain competitive. Operating the battery powered DJI PHANTOM 3 UAS is one such technology that not only allows companies greater operational flexibility compared to manned aircraft, but provides such flexibility without the high operational cost of a traditional manned aircraft.

By operating the DJI PHANTOM 3 UAS, companies such as GSI can remain competitive and profitable, and therefore provide greater job stability to employees and contractors, which will ultimately contribute to growth of the U.S. economy. Improved financial performance of U.S. companies, through commercial use of the DJI PHANTOM 3 UAS, provides a stable workforce that increases consumer spending; improves local, state, and federal tax revenues; and allows companies to invest in research and development in order to remain competitive both in the United States and abroad.

5. There Are No Privacy Issues.

Like the manned aerial acquisition flight operations that have been conducted for decades, the proposed operation of the DJI PHANTOM 3 UAS will not implicate any privacy issues.

Specifically, the DJI PHANTOM 3 UAS will be operated in accordance with operating limitations set forth herein and the Federal Aviation Regulations, including the minimum altitude requirements of 14 C.F.R. § 91.119.

D. The Reasons Why Granting The Exemption Would Not Adversely Affect Safety, Or How The Exemption Would Provide A Level Of Safety At Least Equal To That Provided By The Rule From Which GSI Seeks Exemption.

1. Reasons Why The DJI PHANTOM 3 UAS Meets The Conditions Of The FAA Modernization and Reform Act of 2012 (FMRA) Section 333.

In consideration of the size, weight, speed, and limited operating area associated with the unmanned aircraft and its operation, GSI's operation of the DJI PHANTOM 3 UAS meets the conditions of FMRA Section 333, and will not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H.

Section 333 provides authority for UAS to operate without airworthiness certification and sets forth requirements for considering whether a UAS will create a hazard to users of the NAS or the public, or otherwise pose a threat to national security. Specifically, FMRA Section 333 states the following, in part:

> *(a) In General.--Notwithstanding any other requirement of this subtitle, and not later than 180 days after the date of enactment of this Act, the Secretary of Transportation shall determine if certain unmanned aircraft systems may operate safely in the national airspace system before completion of the plan and rulemaking required by section 332 of this Act or the guidance required by section 334 of this Act.*
>
> *(b) Assessment of Unmanned Aircraft Systems.--In making the determination under subsection (a), the Secretary shall determine, at a minimum--*
>
> > *(1)) which types of unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security; and*

(2)) whether a certificate of waiver, certificate of authorization, or airworthiness certification under section 44704 of title 49, United States Code, is required for the operation of unmanned aircraft systems identified under paragraph (1).

(c) Requirements for Safe Operation.--If the Secretary determines under this section that certain unmanned aircraft systems may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft systems in the national airspace system.

In seeking this exemption, GSI submits that the DJI PHANTOM 3 UAS can operate safely in the NAS pursuant to FMRA Section 333, as demonstrated by: (a) the safe operational history and current use of the DJI PHANTOM 3 UAS in the NAS; (b) the characteristics of the DJI PHANTOM 3 UAS; (c) the private pilot certification requirement; and (d) the specific operating limitations.

a. The DJI PHANTOM 3 UAS Has A Proven History Of Operation In The NAS.

The DJI Phantom 3 utilizes four (4) counter-rotating propellers paired oppositely to each other for balance, control and stability. The total span of the UAS is 590mm including propellers, allowing for stable flight or landing even with the sudden onset of detrimental environmental conditions. The UASs maximum weight (including battery, propellers) of 1.3 Kg. The applicant's UAS is designed to hover in place to capture photographic data and then operate at less than 50 knot maximum speed to the next point of Interest. They are capable of vertical and horizontal operations but, in practice, is operated only within unaided VLOS of the PIC. In addition to the PIC, the Applicant employs a spotter (VOS role) and a technician (secondary VOS and onsite personnel liaison) which are within verbal communication range. In the event of loss of visual of the UAS the PJC can change the flight controls from Cartesian (X,Y,Z.) based controls to radial (r,a,h) based controls which allows the PIC to utilize one controller axis to recall the UAS to the PIC's position without concern to the current heading of the UASs. The UASs also have a Return-to-Home feature that will allow the UAS to return to the PIC's location in the case of the UAS losing signal to the PIC, or if the PIC initiates the Return-to-Home procedure. In the event of loss of sight of the UASs into an area containing hazards or possible hazards, the spotter has a heads-up-display containing a live video feed which can be used to locate the UAS while it maintains its position hover mode. The UAS has demonstrated its ability to maintain its position by GPS, SONAR, *and* Optical flow camera with an accuracy of +/- 10cm vertical and +/- 1m horizontal.

All of the applicant's UAS's utilize LiPo (lithium polymer) battery based power sources, decreasing safety risks from more easily combustible, fuel based, power sources. Flight times generally last between

eight (8) to ten {10} minutes allowing the staff to work with small areas per phase. The maximum flight time without payload is approximately 25 minutes; however practical safe operation limits this to 15 minutes to give ample time to
control the UASs to a safe landing zone. The applicant further restricts flight time by to operating the UASs with less than twenty five percent (25%) battery capacity.

b. The Specifications Of The DJI PHANTOM 3 UAS Demonstrate Its Safe Characteristics.

The DJI PHANTOM 3 UAS does not create a hazard to users of the NAS or the public, or otherwise pose a threat to national security considering its size, weight, speed, and operational capability.

Technical Specifications Of The DJI PHANTOM 3 UAS.

Aircraft

Weight (Including Battery And Propellers)
1280 g
Diagonal Size (Including Propellers)
590 mm
Max Ascent Speed
5 m/s
Max Descent Speed
3 m/s
Hover Accuracy
Vertical: +/- 10cm
Horizontal: +/- 1m
Max Speed
16 m/s (ATTI mode, no wind)
Max Altitude Above Sea Level
6000 m
Operating Temperature
0°C to 40°C
GPS Mode
GPS/GLONASS

Camera

Sensor
Sony EXMOR 1/2.3" Effective pixels: 12.4 M (total pixels: 12.76 M)
Lens
FOV 94° 20 mm (35 mm format equivalent) f/2.8, focus at ∞

ISO Range
100-3200 (video) 100-1600 (photo)
Shutter Speed
8s -1/8000s
Image Max Size
4000 x 3000
Still Photography Modes

Single Shot

Burst Shooting: 3/5/7 shots

Auto Exposure Bracketing (AEB): 3/5

Bracketed Frames at 0.7EV Bias

Time-lapse

Video Recording Modes

Phantom 3 Professional

UHD: 4096x2160p 24/25, 3840x2160p 24/25/30

FHD: 1920x1080p 24/25/30/48/50/60

HD: 1280x720p 24/25/30/48/50/60

Phantom 3 Advanced

FHD: 1920x1080p 24/25/30/48/50/60

HD: 1280x720p 24/25/30/48/50/60

Supported SD Card Types
Micro SD
Max capacity: 64 GB. Class 10 or UHS-1 rating required
Max Bitrate Of Video Storage

Phantom 3 Professional
60 Mbps

Phantom 3 Advanced
40 Mbps
Supported File Formats

FAT32/exFAT

Photo: JPEG, DNG

Video: MP4, MOV (MPEG-4 AVC/H.264)

Operating Temperature
0°C to 40°C

Gimbal
Controllable Range
Pitch -90° to +30°
Stabilization
3-axis (pitch, roll, yaw)

Vision Positioning

Max Velocity

Less than 8 m/s (when 2 m above ground)

Altitude Range

30 cm-300 cm

Operating Range

30 cm-300 cm

Operating Environment

Surface with clear pattern and adequate lighting (Lux > 15)

Remote Controller

Operating Frequency

2.400 GHz-2.483 GHz

Max Distance

2000m (outdoors and unobstructed)

Video Output Port

USB

Operating Temperature

0°C- 40°C

Battery

6000 mAh LiPo 2S

Mobile Device Holder

For tablet or phone

Receiver Sensitivity (1%PER)

-101 dBm ±2 dBm

Transmitter Power (EIRP)

FCC: 20 dBm

CE: 16 dBm

Working Voltage

1.2 A @7.4 V

Battery Charger

Voltage

17.4 V

Rated Power

Phantom 3 Professional

100 W

Phantom 3 Advanced

57 W

Intelligent Flight Battery

Capacity

4480 mAh

Voltage
15.2 V
Battery Type
LiPo 4S
Energy
68 Wh
Net Weight
365 g
Max Flight Time
Approximately 23 minutes
Operating Temperature
-10°C to 40°C
Max Charging Power
100 W

App / Live View
Mobile App
DJI Pilot
EIRP
100mW
Live View Working Frequency
2.4GHz ISM
Live View Quality
720P @ 30fps (depending on conditions and mobile device)
Latency
220ms (depending on conditions and mobile device)
Required Operating Systems

iOS 8.0 or later

Android 4.1.2 or later

Recommended Devices

iOS: iPhone 5s, iPhone 6, iPhone 6 Plus, iPad Air, iPad Air Wi-Fi + Cellular, iPad mini 2, iPad mini 2 Wi-Fi + Cellular, iPad Air 2, iPad Air 2 Wi-Fi + Cellular, iPad mini 3, and iPad mini 3 Wi-Fi + Cellular. This app is optimized for iPhone 5s, iPhone 6, and iPhone 6 Plus

Android: Samsung S5, Note 3, Sony Xperia Z3, Google Nexus 7 II, Google Nexus 9, Mi 3, Nubia Z7 mini

*Support for additional Android devices available as testing and development continues

Phantom 3 Flight System:
Maintaining complete control and stability in the air is crucial to every successful flight. The Phantom 3 contains the best and newest DJI flight technology, giving you an enjoyable experience through full, automatic intelligent support. These systems help you fly better and safer, and are designed so that you never have to think about them at all.

Main Controller:
Processing and analyzing flight data in real time takes serious power. The Main Controller is the control center of your Phantom 3. It collects data from the entire system, including motor speed, GPS location, your command inputs, and data from automatic sensors, and analyzes it all to tell your Phantom 3 exactly how to behave at any given moment.

GPS:
Never lose track of your Phantom 3. GPS and GLONASS combine to make the Phantom 3 completely aware of its location and relation to you. It hovers more precisely, moves more accurately, and locks onto satellites faster. With the new availability of GLONASS, a minimum of 36 satellites are available to you around the world at any time. Through the DJI Pilot app, you can track its location on a live map, and record your takeoff point so you can bring it back to you with the tap of a finger.

IMU:
Keeping your Phantom 3 stable and flying the way you want it to is the Inertial Measurement Unit. Inside is a 6-axis gyroscope and an accelerometer that records and relays even the smallest changes in tilt and movement. It is constantly at work, detecting the slightest changes and compensating for them automatically.

ESCs
Motor speed is critical to flight, and each motor is managed individually by the Electronic Speed Controllers. ESCs not only relay vital motor speed information to the Main Controller, they also send commands back to the motors based on your input. This constant communication keeps your Phantom stable in flight, and also helps you achieve any flight movement, from gentle pans to rapid acceleration.

c. Flights Will Be Conducted Pursuant To Specific Operating Limitations.

In seeking this exemption, GSI proposes to commercially operate the DJI PHANTOM 3 for the special purpose of conducting aerial acquisitions within the NAS, pursuant to the following specific operating limitations:

As much as is possible, the applicant attempts to have a redundancy in expertise and skill sets related to operations of the UASs.

Pilot in Command (PIC)

- Piloting the UAS. This will include:
  - Takeoff
  - Normal flight
  - Flight during emergency procedures
  - Landing
- Assembling the UAS
- Performs pre-flight checks of the firmware
- Performs pre-flight checks of the hardware
- Performs preflight checks of the software

Spotter

- Relays notable flight parameters such as flight times, battery strength, and metrics from the UAS.
- Primary communication between pilot and on-site safety personnel
- Will hold physical documents related to current flight
- Performs pre-flight checks of the data collection equipment
- Monitors ground and greater above-ground environment for safety concerns

Technician

- Assembling the UAS
- Preforms pre-flight checks of the hardware
- Preforms pre-flight checks of the software

- Secondary Communication link between pilot and on-site safety personnel
- Relays to the spotter and records notable flight parameters metrics from the UAS
  Monitors ground and greater above-ground environment for safety concerns

III. Pre-Flight Checklist

A. Before power is applied

- Check for physical damage and any missing hardware
- Check all electronics present and connected/ check cord connections are tight.
- Confirm all batteries are charged
- Check all rotors and moving parts for debris that would prevent proper operation
- Check weather patterns the night beforehand.
- Check all data collection equipment for proper installation/operation
- Check all data collection equipment for issues that would impact safe operations of flight package.

B. After Power Source Applied

- Confirm proper power reading of battery
- Run hardware based systems check
- Run software based systems check
- Check flight LED array
- Confirm proper radio link to flight controller
- Confirm proper radio link to data collection device controller
- Confirm secondary controller connection to UAS onboard flight controller
- Confirm waypoints and geofences are accurate to current flight
- Confirm desired behavior of emergency fail safes
- Check with onsite safety personnel for any changes in goals/flight path

IV. Flight-time Checklist

- Check with on-site personnel for safe flight area for first flight
- Record relevant metrics in flight log
- Check for ground hazards at home-base and rectify
- Confirm more than eight (8) satellite GPS lock
- Confirm Initial state of controllers
- Initialize rotors and check for proper operation
- Perform controlled flight to hover mode approximately five (5)

meters above the ground

- Check landing gear flight mode (up) operation
- Perform controlled multi-axis roll procedure to check for proper orchestrated rotor operation
- Perform controlled multi-axis (if applicable) control procedure of data collection package
- Switch controller mode to radial based, check for proper operation to maximum five (5) meter distance to PI C and return to Initial position
- Return UAS to normal orientation
- Perform controlled flight to hover mode one (1) meter above the ground
- Check landing gear landing mode (down) operation
- Land the UAS and check for proper de-initialization of rotors
- Perform controlled flight to hover mode approximately five (5) meters above the ground
- Check landing gear flight mode (up) operation
- Operate UA5 to each waypoint/position until maximum flight time is achieved
- Return UAS to normal orientation
- Perform controlled flight to hover mode approximately one (1) meter above the ground
- Check landing gear landing mode (down) operation
- Land the UAS and check for proper de-initialization of rotors
- Remove power to the flight package
- Remove power to the data collection package
- Remove power to controllers
- Complete flight log

V. Standing Procedures

- The Pilot, Spotter, and Technician will be the only members in the forward flight area. On-site
  personnel will be within verbal range behind the PIC, Spotter, and Technician
- The maximum power used to control the device is soft limited to 75% in order to maintain power in reserve for unforeseen conditions
- Flight time is limited to 15 minutes and goals will be planned in phases to be accomplished during this time
- Flight time is limited to reserving 25% battery power
- Flight height is soft limited to visible and unaided line of sight (VLOS) 1 and hard limited to 400 ft.
  AGL
- Flight time is limited to operation in safe environmental conditions

- Flight staff will maintain proximity so as to be in clear verbal range
- The PIC will announce all movements to staff and on-site staff so that non-PIC staff members can identify possible safety concerns before operation of the UAS to the next waypoint or position
- All regular and irregular operations are noted with timestamps, relevant UAS metrics and corrective action procedures {CAP) that are performed
    - Note: All irregular behavior have root cause analysis performed before UAS operation is resumed

VI. Emergency procedures

- Loss of Remote Signal
    - The flight package features an optional enhanced fail-safe which returns the UAS to the home base waypoint via the same path taken to point of lost signal
    - The UAS will then perform a hover over this waypoint and then perform a controlled landing

- Loss of GPS signal
    - The system will operate in GPS mode with three (3) satellites
    - At loss of three (3) GPS satellites, manual mode can be activated of the flight package can be programmed to perform a controlled landing to the home base waypoint.
    - Ground based height ranging is performed by separate system and so loss of GPS will not impact controlled landing in a safe manner

- Loss of Ground Control Software
    - This will not affect operation of the flight. The unit will be piloted to a safe landing area then landed so that examination of the link can be made.

2. Reasons Why An Exemption From The Requirements Of Section 61.113(a) And (b) Would Not Adversely Affect Safety.

GSI submits that an equivalent level of safety established by Section 61.113(a) and (b) will be maintained because no PIC will be allowed to operate the DJI PHANTOM 3 UAS unless that PIC has demonstrated, through the DJI PHANTOM 3 UAS training, that the PIC is able to safely operate the DJI PHANTOM 3 UAS in a manner consistent with this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from

people, vessels, vehicles and structures.

Considering GSI's proposed area of operations and the operating limitations set forth-above; the parallel nature of private pilot aeronautical knowledge requirements to those of commercial pilot requirements (*See* Exemption No. 11062); and the airmanship skills necessary to safely operate the DJI PHANTOM 3 UAS, GSI submits that the additional manned airmanship experience of a commercially certificated pilot would not correlate to the airmanship skills necessary for GSI's specific proposed flight operations.

As in Exemption No. 11109, GSI will not allow any PIC to operate the DJI PHANTOM 3 UAS unless that PIC has demonstrated through the DJI PHANTOM 3 UAS training requirements that the PIC is able to safely operate the DJI PHANTOM 3 UAS in a manner consistent with this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from people, vessels, vehicles and structures.

3. Reasons Why An Exemption From The Requirements Of Section 91.7(a) Would Not Adversely Affect Safety.

The level of safety established by Section 91.7(a) will be maintained because prior to every flight, GSI will ensure that the DJI PHANTOM 3 UAS is in an airworthy condition and safe for flight based upon the DJI PHANTOM 3 UAS's compliance with its operating documents and as stated in the **conditions and limitations herein.**

4. Reasons Why An Exemption From The Requirements Of Section 91.121 Would Not Adversely Affect Safety.

The equivalent level of safety established by Section 91.121 will be maintained because the altitude of the DJI PHANTOM 3 UA will be reported to air traffic control (ATC) in feet above ground level (AGL), and GSI will operate the DJI PHANTOM 3 UA within visual line of sight, at or below 400 feet AGL. Prior to each flight, a zero altitude initiation point is established at ground level.

The FAA has previously granted relief from Section 91.121 specific to UAS, in

circumstances similar, in all material respects, to those presented herein.

5. Reasons Why An Exemption From The Requirements Of Sections 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), And 91.417(a) & (b) Would Not Adversely Affect Safety.

In seeking this exemption, GSI submits that the level of safety with regard to the regulatory maintenance and alteration requirements established

by Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), 91.417(a) & (b) will be met because GSI, will use its trained technicians to perform maintenance, alterations, or preventive maintenance on the unmanned aircraft system using the methods, techniques, and practices prescribed in the manufacturer's maintenance manual. Furthermore, GSI will document and maintain all maintenance records for the DJI PHANTOM 3 UAS.

The Applicant contends that operation of its UASs will not "create a hazard to users of the national airspace system or the public." As stated in 112 P.L 95 § 333(b). Given the diminutive size and weight of the UASs, combined with their operation in cordoned off and well-controlled areas. The applicant's UASs falls within congress's contemplated safety zone. The applicant's UASs have an established safety record bolstered by multi-point preflight checklists, awareness of their surroundings and intimate knowledge and behavior of the UASs platform In many weather conditions. This safety record and implemented operational practices demonstrates an awareness of public safety.

The Applicant's operations routinely provide a level of safety *at* least equal to existing rules and in nearly every instance, exceeds existing rules.

The applicant's UASs does not and cannot operate on or near airports and generally has only operated its fleet on private grounds with cordoned off areas or areas under the control of the property owner/ client with assistance by safety officials employed by the business. The applicant determines the areas needed to fulfill the clients goals and only operates its UASs in these flight zones and only in compliance with well-regarded safety protocols set forth initially by the RC UAS trade and hobby groups and recently codified by relevant FARs.

The applicant is standardized on the following practices to ensure safe operations of its UASs safe;

Work with on-site personnel to plan the flight goals.

Work with on-site personnel to restrict access to non-essential persons.

Operations by unaided VLOS operations only.

Operation phases of 15 minutes in length.

Operation to minimal 25% battery power.

Operation of device to GPS aided readout of no more than 400 feet AGL.

Numerous pre-programmed fail-safes that ensure specific behavior per issue.

Three main roles supplemented by on-site safety personnel.

Employ controlled lifecycle management of components to guard against failures.

Preform a site check day(s) before flight to identify potential issues.

Subscribe to relevant local and safety alerts

Expertly choose data collection instruments and accessories to minimize flight requirements or expertise.

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 site and national security- provide more than adequate justification for the grant of the requested exemptions allowing commercial operation of the applicant's UASs in conducting aerial acquisitions and research for geotechnical hazards.

6. The FAA May Prescribe Any Other Conditions For Safe Operation.

In accordance with Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA) and 14 C.F.R. § 21.16 entitled *Special Conditions*, GSI requests that the FAA prescribe special conditions for the intended operation of the DJI Phantom 3, which contain such safety standards that the Administrator finds necessary to establish a level of safety equivalent to that established by 14 C.F.R. Part 21, Subpart H, and 14 C.F.R. §§ 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b). Such special conditions will permit

safe operation of the unmanned aircraft for the limited purpose of conducting aerial acquisitions within the NAS. FMRA Section 333 sets forth the requirements for considering whether a UAS will create a hazard to users of the NAS or the public, or otherwise pose a threat to national security; and further, provides the authority for such UAS to operate without airworthiness certification in accordance with any requirements that must be established for the safe operation of the aircraft systems in the NAS.

Likewise, the Administrator may prescribe special conditions pursuant to 14 C.F.R. § 21.16, for operation of the DJI Phantom 3, since the airworthiness regulations of 14 C.F.R. Part 21 do not contain adequate or appropriate safety standards, due to the novel or unusual design features of the aircraft. Section 21.16, entitled *Special Conditions*, states the following: If the FAA finds that the airworthiness regulations of this subchapter do not contain adequate or appropriate safety standards for an aircraft, aircraft engine, or propeller because of a novel or unusual design feature of the aircraft, aircraft engine or propeller, he prescribes special conditions and amendments thereto for the product. The special conditions are issued in accordance with Part 11 of this chapter and contain such safety standards for the aircraft, aircraft engine or propeller as the FAA finds necessary to establish a level of safety equivalent to that established in the regulations.

See 14 C.F.R. § 21.16.

Therefore, in accordance with FMRA Section 333 and 14 C.F.R. § 21.16, the FAA may prescribe special conditions for GSI's intended operation of the DJI PHANTOM 3 UAS, which contain such safety standards that the Administrator finds necessary to establish a level of safety equivalent to that established by 14 C.F.R. Part 21, Subpart H, and 14 C.F.R. Sections 61.113(a)

& (b), 91.7(a), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).

E. A Summary That Can Be Published In The *Federal Register*, stating:

The Rules From Which GSI Seeks Exemption:

GSI seeks exemption from the requirements of 14 C.F.R. Sections 61.113(a) & (b), 91.7(a), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).

A Brief Description Of The Nature Of The Exemption GSI Seeks:

This exemption will permit GSI to commercially operate an Unmanned Aircraft System (UAS) for the purpose of conducting aerial acquisitions and research within the National Airspace System (NAS).

F. Any Additional Information, Views, Or Arguments Available To Support GSI's Request.

This Petition is made pursuant to the FAA Modernization and Reform Act of 2012 (FMRA) Section 333, which directs the Secretary of Transportation to determine if certain UAS may operate safely in the NAS. As such, GSI's request for exemption may be granted pursuant to the authority of FMRA Section 333 and 14 C.F.R. Part 11, as set forth above.

FMRA Section 333 sets forth the requirements for considering whether a UAS will create a hazard to users of the NAS or the public, or otherwise pose a threat to national security; and

further, provides the authority for such UAS to operate without airworthiness certification.

As discussed in detail above, the DJI PHANTOM 3 UAS has in the past, and will continue in the future, to operate safely in the NAS without creating a hazard to users of the NAS, or the public, or otherwise pose a threat to national security.

CONCLUSION

As set forth herein, GeoStabilization International, LLC seeks an exemption pursuant to 14 C.F.R. § 11.61 and Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA), which will permit safe operation of the DJI PHANTOM 3 UAS commercially, without an airworthiness certificate, for the limited purpose of conducting aerial acquisitions within the National Airspace System (NAS).

By granting this Petition, the FAA Administrator will be fulfilling the Congressional mandate of the FAA Modernization and Reform Act of 2012, while also advancing the interests of the public, by allowing GSI to safely, efficiently, and economically operate the DJI PHANTOM 3 UAS commercially within the NAS.

WHEREFORE, in accordance with the Federal Aviation Regulations and the FAA Modernization and Reform Act of 2012, Section 333, GSI respectfully requests that the Administrator grant this Petition for an exemption from the requirements of 14 C.F.R. Sections 61.113(a) & (b), 91.7(a), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2),and 91.417(a) & (b), and permit GSI to operate the DJI PHANTOM 3 UAS for the purpose of conducting aerial acquisitions and research within the NAS.

Dated: May 18, 2015

Respectfully submitted,

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