



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

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

April 9, 2015

Exemption No. 11317
Regulatory Docket No. FAA-2014-1054

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Dear Mr. Winton:

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.

The Basis for Our Decision

By letter dated December 12, 2014, you petitioned the Federal Aviation Administration (FAA) on behalf of Altavian, Inc. (hereinafter petitioner or operator) for an exemption. The exemption would allow the petitioner to operate an unmanned aircraft system (UAS) to conduct aerial acquisitions and research over certain rural areas of the United States.

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

Discussion of Public Comments:

A summary of the petition was published in the Federal Register on January 8, 2015, (80 FR 1068). The FAA received two comments. The Air Line Pilots Association, International (ALPA) and the National Agricultural Aviation Association (NAAA) both opposed the petition.

ALPA expressed concern regarding several aspects of the petition. ALPA noted that the anticipated operation is expected to occur below 1,200 feet above the surface in rural areas. ALPA stated that the petition does not define “rural areas” nor does it offer a means to control the airspace or areas of operations. Specifically, ALPA stated “there must be means both to ensure that the sUAS remains within the defined airspace and to ensure that the hazard of other aircraft intruding on the operation is mitigated.”

The FAA believes the limitations under which the petitioner will operate (i.e., visual line of sight (VLOS) and at or below 400 feet above ground level (AGL)) are sufficient mitigations to this risk so that the operations will not adversely affect safety.

Regarding the petitioner’s statement that the pilot in command (PIC) and observer will be able to communicate by voice, ALPA stated the pilot and observer should be able to maintain a visual observation of the aircraft and area of operation when using voice communication. NAAA stated UAS observers must be present and able to communicate with the operator from the most minimal distance possible. The conditions and limitations regarding PIC and visual observer communications address those concerns.

ALPA asserted the UAS’s lithium polymer batteries have numerous associated fire and explosion hazards as outlined in DOT/FAA/AR-09/55, “Flammability Assessment of Lithium-Ion and Lithium-Ion Polymer Battery Cell Designed for Aircraft Power Usage (January 2010),” and that the safe carriage of the batteries and the mitigations in place for known risks should be addressed. The referenced study was primarily conducted to determine how certain battery cells react in a fire situation aboard manned airplanes. Given the size of the battery and the operating conditions of the UAS, the FAA concludes that the use of a lithium polymer battery will not pose an undue safety risk for the proposed operations.

ALPA commented that command and control (C2) link failures are one of the most common failures on a UAS, and that lost link mitigations should require safe modes to prevent fly-aways or other scenarios. The FAA has inserted conditions and limitations in this exemption to mitigate the risk associated with such failures.

ALPA also noted that the petitioner’s proposed operations are for “compensation or hire,” and therefore contends the pilot must hold at least a current FAA commercial pilot certificate with an appropriate category and class rating for the type of aircraft being flown, as well as specific and adequate training on the UAS make and model intended to be used. Similarly, ALPA asserted a current second-class airman medical certificate should be required. NAAA also commented on pilot qualification, stating—

Just as manned aircraft pilots are required to undergo a rigorous training curriculum and show that they are fit to operate a commercial aircraft, so too must UAS operators. Holding a commercial certificate holds UAS operators to similar high standards as commercial aircraft operators and ensures they are

aware of their responsibilities as commercial operators within the NAS. Medical requirements ensure they have the necessary visual and mental acuity to operate a commercial aircraft repeatedly over a sustained period of time.

The FAA has reviewed the knowledge and training requirements of sport, recreational, private and commercial certificates and concluded that a UAS PIC holding a minimum of a sport pilot certificate, and operating under this exemption, would not adversely affect operations in the NAS or present a hazard to persons or property on the ground.

Although the petitioner did not request an exemption from § 91.113, ALPA noted the petitioner must specify a means to meet see and avoid requirements in § 91.113 given the absence of an onboard pilot. The FAA notes that all flights must be operated within VLOS of the PIC and VO.

Regarding the fuel requirements of § 91.151, ALPA argued that using batteries as the only source of an aircraft's power is a substantial shift from traditional methods of propulsion, and requires further research to determine best safety practices.

Regarding §§ 91.405(a), 91.407(a)(1), 91.409(a)(2), and 91.417(a) and (b), ALPA opposed the petitioner's attempt to avoid compliance with established aircraft maintenance and recordkeeping requirements. ALPA states the UAS should comply with the same level of safety as other aircraft operated commercially in the NAS. The FAA finds that adherence to the petitioner's operating documents, as required by the conditions and limitations below, is sufficient to ensure that safety is not adversely affected.

ALPA also expressed concern that the petitioner's request is not for a single specific operation or location, but for all operations of the same general type. ALPA stated that this results in a considerable increase in the FAA's oversight tasks. The FAA notes ALPA's concern and in order to minimize potential impact to the NAS, the FAA requires that each operator secure a Certificate of Authorization or COA which covers specific details of the petitioner's operation. The FAA recognizes that UAS integration will generate new NAS access demand and will review and adjust accordingly.

NAAA noted that its members operate in low level airspace, and therefore clear low level airspace is vital to the safety of these operators. NAAA stated that seeing and avoiding other aircraft and hazardous obstructions is the backbone for agricultural safety, and that agricultural pilots depend on pilots of other aircraft to perform their see and avoid functions to prevent collisions. NAAA believes UAS operations at low altitudes will increase the potential for collision with agricultural aircraft.

The FAA recognizes these concerns and has incorporated associated conditions and limitations into this exemption, including: (a) a Notice to Airmen (NOTAM) issued for all operations; (b) operations conducted within VLOS of the pilot in command (PIC) and the VO; and (c) the UAS PIC must always yield right-of-way to manned aircraft.

NAAA stated that FAA airworthiness certification should be a requirement for all unmanned aircraft to operate within the NAS. NAAA recommended UAS be equipped with ADS-B or similar identification and positioning systems, strobe lights, high-visibility markings and registration numbers. NAAA also recommended UAS be operated strictly within the line-of-sight of the ground controller, with the assistance of a VO and well clear of any low-flying manned aircraft.

As discussed below, Section 333 of the FAA Modernization and Reform Act of 2012 authorizes the Secretary of Transportation to determine, considering a number of factors laid out in the statute, that an airworthiness certificate is not necessary for certain operations. The Secretary has made that determination in this case and therefore the aircraft operated by the petitioner will not need to be certificated by the FAA.

Airworthiness Certification

The UAS proposed by the petitioner is the Altavian Nova F6500.

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 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, Altavian, 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, Altavian, 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 Altavian Nova F6500 when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.
2. Operations for the purpose of closed-set motion picture and television filming are not permitted.
3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.
4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude must be reported in feet AGL.
5. The UA must be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate or U.S. driver's license.
6. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. The VO may be used

to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents, the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS-80) may be contacted if questions arise regarding updates or revisions to the operating documents.
8. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g. replacement of a flight critical component, must undergo a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.
9. The operator is responsible for maintaining and inspecting the UAS to ensure that it is in a condition for safe operation.
10. Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, e.g. inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.

11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.
12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.
13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.
14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.
15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.
16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.
17. The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.
18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.

19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.
20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.
21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The exemption holder may apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.
22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N-Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.
23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.
24. The UA must remain clear and give way to all manned aviation operations and activities at all times.
25. The UAS may not be operated by the PIC from any moving device or vehicle.
26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
 - a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and,
 - b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

The PIC, VO, operator trainees or essential persons are not considered nonparticipating persons under this exemption.

27. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative. Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.
28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS-80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.nts.gov.

If this exemption permits operations for the purpose of closed-set motion picture and television filming and production, the following additional conditions and limitations apply.

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.
30. At least 3 days before aerial filming, the operator of the UAS affected by this exemption must submit a written Plan of Activities to the local Flight Standards District Office (FSDO) with jurisdiction over the area of proposed filming. The 3-day notification may be waived with the concurrence of the FSDO. The plan of activities must include at least the following:
 - a. Dates and times for all flights;
 - b. Name and phone number of the operator for the UAS aerial filming conducted under this grant of exemption;
 - c. Name and phone number of the person responsible for the on-scene operation of the UAS;
 - d. Make, model, and serial or N-Number of UAS to be used;
 - e. Name and certificate number of UAS PICs involved in the aerial filming;
 - f. A statement that the operator has obtained permission from property owners and/or local officials to conduct the filming production event; the list of those who gave permission must be made available to the inspector upon request;
 - g. Signature of exemption holder or representative; and
 - h. A description of the flight activity, including maps or diagrams of any area, city, town, county, and/or state over which filming will be conducted and the altitudes essential to accomplish the operation.
31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

Unless otherwise specified in this grant of exemption, the UAS, the UAS PIC, and the UAS operations must comply with all applicable parts of 14 CFR including, but not limited to, parts 45, 47, 61, and 91.

This exemption terminates on April 30, 2017, unless sooner superseded or rescinded.

Sincerely,

/s/

John Barbagallo

Acting Deputy Director, Flight Standards Service

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

Regulatory Docket No. _____

**IN THE MATTER OF THE PETITION FOR EXEMPTION OF:
ALTAVIAN, INC.
FOR AN EXEMPTION SEEKING RELIEF FROM THE REQUIREMENTS OF
TITLE 14 OF THE CODE OF FEDERAL REGULATIONS
SECTIONS 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) CONCERNING COMMERCIAL OPERATION OF THE
NOVA F6500 UNMANNED AIRCRAFT SYSTEM
PURSUANT TO SECTION 333 OF
THE FAA MODERNIZATION AND REFORM ACT OF 2012 (PUBLIC LAW 112-95)**

Submitted on December 12, 2014

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TABLE OF CONTENTS

	Page
GLOSSARY OF ABBREVIATIONS	3
SUMMARY	4
INTRODUCTION AND INTERESTS OF PETITIONER	4
BACKGROUND	5
BASIS FOR PETITION	6
NAME AND ADDRESS OF PETITIONER.....	7
THE SPECIFIC SECTIONS OF 14 C.F.R. FROM WHICH ALTAVIAN, INC. SEEKS EXEMPTION	8
THE EXTENT OF RELIEF ALTAVIAN, INC. SEEKS AND THE REASON ALTAVIAN, INC. SEEKS THE RELIEF	10
THE REASONS WHY GRANTING ALTAVIAN, INC.'S REQUEST WOULD BE IN THE PUBLIC INTEREST	11
THE REASONS WHY GRANTING THE EXEMPTION WOULD NOT ADVERSELY AFFECT SAFETY	15
SUMMARY THAT CAN BE PUBLISHED IN THE FEDERAL REGISTER.....	33
ANY ADDITIONAL INFORMATION, VIEWS, OR ARGUMENTS AVAILABLE TO SUPPORT ALTAVIAN, INC.'S REQUEST	34
CONCLUSION.....	34

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
LOL	Loss of Link
NAS	National Airspace System
NOTAM	Notice to Airman
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 Site
VMC	Visual Meteorological Conditions
VO	Visual Observer

SUMMARY

Altavian, Inc. seeks exemption from the requirements of 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), to operate an Unmanned Aircraft System pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA). This exemption will permit Altavian, Inc. to operate an Unmanned Aircraft System (UAS) for the commercial purpose of conducting aerial acquisitions and research over certain rural areas of the United States.

INTRODUCTION AND INTERESTS OF THE PETITIONER

Altavian, Inc. (hereinafter referred to as “Altavian”) is an unmanned aircraft solutions provider that integrates engineering and manufacturing with services that enable the technology for federal, state, local, and commercial clients. Altavian is focused on providing solutions for utilizing unmanned aircraft to safely and efficiently collect data that is precise, accurate, and timely.

Altavian’s mission is to use unmanned aircraft to simplify and increase the effectiveness of data collection in: Natural Resources and Conservation, Construction and Infrastructure, Precision Agriculture, as well as Inspection and Monitoring.

As set forth in this Petition, Altavian seeks to commercially operate its Nova F6500 UAS over certain rural areas of the United States for the purpose of conducting aerial acquisitions and research.

BACKGROUND

Unmanned Aircraft System: Altavian Nova F6500 UAS

Altavian seeks an exemption to operate the Altavian Nova F6500 UAS (also known as the Nova Block III UAS), for compensation or hire within the national airspace system (“NAS”). The Nova F6500 UAS is comprised of an amphibious unmanned aircraft (UA) and a transportable ground control station. The Nova F6500 UA has a maximum gross weight of approximately fifteen (15) pounds, while having a wingspan of 108 inches and a length of 65 inches. The Nova F6500 UA is equipped with a single propeller driven by a Lithium Polymer battery powered electric motor.

The Nova F6500 UA that will be operated by Altavian 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*, and marked in accordance with 14 C.F.R. Part 45, *Identification and Registration Marking*.



Figure 1: The Nova F6500 UA.
Previous Sec. 333 Grant Of Exemption and the
Proven Operational History of the Nova F6500 UAS

On December 10, 2014, Woolpert, Inc. was granted two exemptions pursuant to Sec. 333, FMRA, to commercially operate the Nova F6500 UAS (also known as the Nova Block III) for the purpose of conducting precision aerial surveys over certain rural areas of the state of Ohio (Regulatory Docket No. FAA-2014-0506, Exemption No. 11111) and Ship Island, Mississippi (Regulatory Docket No. FAA-2014-0398, Exemption No. 11114). As such, the Nova F6500 UAS has already been granted exemptions pursuant to Sec. 333, FMRA, to operate commercially in the NAS for the purpose of performing aerial acquisitions.

In addition to receiving an Airworthiness Release Qualification Level 3 from the U.S. Army, the Nova F6500 UAS is currently operating safely within the NAS pursuant to approximately fifteen (15) Certificates of Authorization (“COA”) granted by the Federal Aviation Administration (“FAA”) to the Middle Tennessee State University; Sinclair Community College in Dayton, Ohio; the U.S. Army Corps of Engineers (Jacksonville District and Mobile District); Mississippi State University for the Pearl River Basin; and the University of Florida. The U.S. Army Corps of Engineers will be operating the Nova F6500 UAS pursuant to additional COAs in the foreseeable future, pending approval by the FAA.

BASIS FOR PETITION

Petitioner, Altavian, Inc., by and through undersigned counsel, 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 Nova F6500 UAS in the national airspace system, and for an exemption from the requirements of 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).

In consideration of the size, weight, speed, and limited operating area associated with the unmanned aircraft and its operation, Altavian's operation of the Nova F6500 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, Altavian 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.

Altavian submits that the requested relief is proper since an equivalent level of safety will be ensured. Altavian, as the manufacturer of the Nova F6500 UAS, 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, Altavian will document and maintain all maintenance records for the Nova F6500 UAS.

Altavian also seeks an exemption from the requirements of Section 91.151(a)(1), *Fuel requirements for flight in VFR conditions*. Altavian submits that safety will not be affected by terminating flights of the battery powered Nova F6500 UA after 80 minutes of continuous operation, with 10 minutes remaining battery power.

In accordance with 14 C.F.R. § 11.81, Altavian 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:

Altavian, Inc.
1724 NE 2nd Street
Gainesville, Florida 32609

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

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B. The Specific Sections Of 14 C.F.R. From Which Altavian Seeks Exemption.

1. Altavian 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 30 minutes[.]

2. Altavian 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[.]

3. Altavian 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 § 43.7 of this chapter[.]

4. Altavian 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:

(a) 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.

5. Altavian 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.

C. The Extent Of Relief Altavian Seeks And The Reason Altavian Seeks The Relief.

1. Extent Of Relief Altavian Seeks And The Reason Altavian Seeks Relief From Section 91.151(a)(1).

Relief from Section 91.151(a)(1) is requested to the extent required to allow flights of the battery powered Nova F6500 UA during daylight hours in visual flight rules (VFR) conditions to continue for a total duration of 80 minutes, with 10 minutes of battery power remaining.

Altavian seeks the requested relief because without an exemption from Section 91.151(a)(1), the flight time duration of the battery powered Nova F6500 UA will be reduced by one third, which would severely constrain the practicality of any aerial acquisition and research operations that Altavian proposes to conduct pursuant to this Petition.

Significantly, as set forth below, the technical specifications of the Nova F6500 UAS, the Nova Operations Manual, and Altavian's proposed operating limitations, ensure that Altavian will safely operate the battery powered Nova F6500 UA during daylight hours in VFR conditions for a total duration of 80 minutes, with 10 minutes of battery power remaining.

2. Extent Of Relief Altavian Seeks And The Reason Altavian 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, Altavian requests relief from these Sections because the Nova F6500 UAS does not require an airworthiness certificate. As set forth more fully below, the Nova F6500 UAS meets the conditions of Section 333 for operation without an airworthiness certificate. Accordingly, Altavian, which manufactures the Nova F6500 UAS, will use Altavian 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, Altavian will document and maintain all maintenance records for the Nova F6500 UAS.

D. The Reasons Why Granting Altavian'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 Altavian to safely, efficiently, and economically perform aerial acquisitions and research over the United States, commercially, in support of government entities, agriculture, scientific studies, wildlife monitoring, forestry, and the oil and gas industries. Additionally, use of the Nova F6500 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 Nova F6500 UAS will be realized without implicating any privacy issues.

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

Altavian submits this Petition to commercially operate the Nova F6500 UAS and perform aerial acquisition and research throughout the United States, in support of government entities, agriculture, scientific studies, wildlife monitoring, forestry, mining, and the oil and gas industries. The Nova F6500 UAS will provide safe, efficient, and economical aerial acquisition and research operations to further each of these fields, all of which are critical to the well-being of the general public.

The specific operations that Altavian will perform with the Nova F6500 UAS demonstrate how the requested exemption will directly benefit the above-referenced industries and the public. In agriculture, the aerial acquisition performed by the Nova F6500 UAS will be used to predict crop yields, research and prevent crop disease, and increase crop yields. In the oil and gas industry, the Nova F6500 UAS will be used to aid in facility inspections, surveying and planning new worksites, volumetric analysis, and performing right of way analysis. The Nova F6500 UAS will also further environmental management by researching invasive species, mapping deforestation, and surveying point source pollution.

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

The Nova F6500 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 Nova F6500 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 Nova

F6500 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 Nova F6500 UAS.

Conducting aerial acquisitions with the Nova F6500 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 Nova F6500 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 Nova F6500 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 Nova F6500 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 Nova F6500 UA (weighing approximately fifteen (15) pounds at its maximum gross weight with a wingspan of 108 inches and a length of 65 inches, 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).

4. Performing Aerial Acquisition Operations With The Nova F6500 UAS Will Benefit The Economy.

In addition to being safe and efficient, the Nova F6500 UAS is also an economical alternative to using manned aircraft to conduct aerial acquisitions. As such, operation of the Nova F6500 UAS will allow United States based companies, like Altavian, 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 Nova F6500 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 Nova F6500 UAS, companies such as Altavian 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 Nova F6500 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 Nova F6500 UAS will not implicate any privacy issues.

Specifically, the Nova F6500 UAS will be operated only in rural areas, and in accordance with all Federal Aviation Regulations, including the minimum altitude requirements of 14 C.F.R. § 91.119. Most significantly, the Nova F6500 UAS will not be operated closer than 500 feet to any person, vessel, vehicle, or structure, which is not directly involved in the operation.

E. 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 Altavian Seeks Exemption.

1. Reasons Why The Nova F6500 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, Altavian's operation of the Nova F6500 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, Altavian submits that the Nova F6500 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 Nova F6500 UAS in the NAS; (b) the characteristics of the Nova F6500 UAS; (c) the private pilot certification requirement; and (d) the specific operating limitations.

a. The Nova F6500 UAS Has A Proven History Of Operation In The NAS Pursuant To A Certificate Of Authorization (“COA”).

The Nova F6500 UAS has already been granted exemptions pursuant to Sec. 333 to operate commercially in the NAS for the purpose of performing aerial acquisitions. On December 10, 2014, Woolpert, Inc. was granted two exemptions pursuant to Sec. 333 to commercially operate the Nova F6500 UAS (also known as the Nova Block III) for the purpose of precision aerial surveys over certain rural areas located within the state of Ohio (Regulatory Docket No. FAA-2014-0506, Exemption No. 11111) and Ship Island, Mississippi (Regulatory Docket No. FAA-2014-0398, Exemption No. 11114).

In addition to receiving an Airworthiness Release Qualification Level 3 from the U.S. Army, the Nova F6500 UAS is currently operating safely within the NAS pursuant to approximately fifteen (15) Certificates of Authorization (“COA”) granted by the Federal Aviation Administration (“FAA”) to the Middle Tennessee State University; Sinclair Community College in Dayton, Ohio; the U.S. Army Corps of Engineers (Jacksonville District and Mobile District); Mississippi State University for the Pearl River Basin; and the University

of Florida. The U.S. Army Corps of Engineers will be operating the Nova F6500 UAS pursuant to additional COAs in the foreseeable future, pending approval by the FAA.

b. The Specifications Of The Nova F6500 UAS Demonstrate Its Safe Characteristics.

The Nova F6500 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.

i. Technical Specifications Of The Nova F6500 UAS.

Unmanned Aircraft System	The Nova F6500 is an Unmanned Aircraft System that is comprised of an amphibious unmanned aircraft and a transportable ground station.
Unmanned Aircraft Dimensions	Wingspan: 108 in. Length: 65 in.
Engine (Propulsive Unit)	<p><u>Engine (Propulsive Unit)</u></p> <p>(1) Altavian Inc. P/N : 30027 (Electric) FAA Engine Type Cert: None Propulsive Unit Type: 25V, 11 Amp Hour capacity, Lithium ion battery powered, direct drive electric motor</p> <p><u>Motor, Electric Sub-Assembly:</u> Manufacturer: NeuMotor Model: 1509 2.0 HP Peak Power Direct Drive 10 oz. Wt.</p> <p><u>Motor, Controller Sub-Assembly:</u> Manufacturer: Castle Creation Model: Phoenix Ice 100 Type: Speed Controller 100 Amps Maximum 4.6 oz. Wt.</p>

	<u>Motor, Battery:</u> Manufacturer: MaxAmps, Inc. Type: Lithium Ion 11 Amp hour 22.2V (nominal)
Fuel	Not Applicable. NOTE: The Nova F6500 UAS is powered by a Lithium Polymer rechargeable battery, Altavian P/N 30142.
Engine (Propulsive Unit) Limits	Maximum Power Output: 2.0 HP Maximum RPM: 60,000 RPM (reduced to a propeller RPM of 7,200) Maximum Motor Temperature: 170 °F (77 °C) NOTE: The motor temperature is not displayed to the operator. Maximum motor, controller sub-assembly temperature: 194 °F (90 °C) Minimum voltage, motor battery during pre-flight engine run up after 3 sec. at max throttle: 22.6V
Propeller and Propeller Limits	(1) Altavian Inc. P/N 30360 FAA Propeller Type Certificate: None Propeller Type: 2-blade, hinged (folding), carbon fiber reinforced plastic, fixed pitch, tractor <u>Propeller Sub-Assembly:</u> Manufacturer: Aeronaut Model: CAM 15x13 Diameter (Nominal): 15 in.
Battery Command & Control	Nova Air Vehicle Battery P/N 30142 powers the motor, and battery command and control.
Airspeed Limits	Vne (Never Exceed Speed) 58 knot (30 m/s) Vno (Maximum Structural Cruising Speed) 48 knots (25 m/s) Va (Maneuvering Speed) 48 knots (25 m/s) Landing Speed: 27 knots (14 m/s)

Empty Weight C.G. Range	20.2 – 21.7 inches aft of datum
Datum	Front of Motor Case
Mean Aerodynamic Chord (MAC)	13 in. long with leading edge 21.2 in. from nose
Leveling Means	Not Applicable.
Maximum Weights	Ramp 15 lbs. Takeoff 15 lbs. Landing 15 lbs.
Empty Weight	8.35 lbs. NOTE: Empty Weight Excludes weight of battery and payload modules.
Frequencies	902-928 MHz (ISM Band) 2.4 GHz (ISM Band) NOTE: FCC license is not required to utilize the above frequencies; uplink and downlink are on the 900Mhz band. If video is utilized, uplink, downlink, and video are all on 2.4 Ghz.
Computer Software	Avionics embedded processor, P/N 30138
Minimum Crew	(1) The Nova F6500 UAS can be operated by a single operator.

Number of Seats	(0) Not Applicable.
Fuel Capacity	Not Applicable.
Oil Capacity	Not Applicable.
Max. Operating Altitude	1,200 ft. AGL
Control Surface Movements	<div>Wing Flaps</div> <div>N/A</div> <div>Aileron</div> <div>Up 30° Down 30°</div> <div>“V” tail elevator action</div> <div>Up 60° Down 60°</div> <div>“V” tail rudder action</div> <div>Up 60° Down 60°</div> <div>“V” tail max. combination Rudder elevator action</div> <div>Up 60° Down 60°</div>
Nominal Endurance	90 minutes above 32 °F (0 °C) 45 minutes below 32 °F (0 °C)
Ambient Outside Air Temperature (OAT)	Maximum OAT: 120 °F (49 °C) Minimum OAT At Altitude: -20 °F (-29 °C)
Wind Limitation	19 knots
Maintenance	This Nova F6500 UAS must be maintained in accordance with the manufacturer’s maintenance manual, or later FAA accepted revision.

ii. The Nova F6500 UAS Autonomous Flight And Navigation Modes Enable The UAS To Remain Within A Defined Operational Area.

A complete description of the autonomous modes and methods of navigation for the Nova F6500 UAS is provided in the Nova F6500 UAS Operator Manual at pages 7-2 through 7-4. A copy of the Nova F6500 UAS Operator Manual, which contains proprietary information, is attached hereto as Exhibit A, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b)¹.

iii. The Nova F6500 UAS Is Designed For Complete Autonomy From Launch To Landing Even In The Unlikely Event Of Loss Of The Control Link Or Navigation.

Although a degradation or loss of the control link, and/or degradation or loss of the source of navigation, is unlikely, it is a situation that is well planned for and therefore, is a benign event. The Nova F6500 UA is designed for complete autonomy from launch to landing with a line of sight operator in the loop monitoring the airframe.

The Nova F6500 unmanned aircraft (UA) uses a two-stage failsafe approach for all avionics failure conditions, including the event of a loss of communications (“Lost Link”). Upon loss of the communication signal, the Nova F6500 UA will attempt to reacquire the link. If after 10 seconds the link has not been reacquired, the Nova F6500 UA will continue to attempt to reacquire the link while maintaining the current altitude and navigating to the home waypoint, which is the same as the location of the ground control station. Once at the home waypoint, the Nova F6500 UA will loiter while continuing its attempt to reacquire the link for 300 seconds (to allow for rebooting of the ground control station, if needed). The Nova F6500 UA will then continue to attempt to re-acquire the link while it navigates through the landing procedure.

¹ Exhibits to this Petition contain proprietary information, and in accordance with 14 C.F.R. § 11.35(b), are not to be included in the Federal Docket Management System (FDMS).

The landing procedure for Lost Link is identical to a normal landing procedure. The Nova F6500 UA will descend from “minimum safe altitude” to a breakout altitude (site specific) while continuing to loiter around the rally point. Once at the breakout altitude, the Nova F6500 UA will depart the loiter along a tangential path toward the touchdown spot. The Nova F6500 UA will descend on glide slope from the tangent point to the touchdown spot, slowing down to flair speed (12m/s) in the final moments before touchdown and automatically flare 3 meters above the ground.

Loss of GPS signal will result in a two tiered recovery approach. Upon loss of a GPS signal, the Nova F6500 UA will immediately enter a loiter orbit in an attempt to reacquire a signal. If after 15 seconds, GPS is not reacquired, the UA will enter tier two. At any time in tier one or two, the operator can take over with augmented control and utilize its onboard magnetometer to navigate back to the home waypoint through dead-reckoning. During this failure mode, the observer will call out UA position and movement back to the operator. Once the UA is close enough to resolve orientation, or if operating with a live video payload, the operator can engage manual control and perform a manual landing at the pre-decided landing site.

If a cascade of failures has occurred and Lost-Link has also occurred during tier two, the Nova F6500 UA will enter into a loiter-land procedure; descending in a loiter while reducing speed until contact with the ground at flair speed. During this decent, the Nova F6500 UA is still in controlled flight and at touchdown the forward speed should not exceeded 11 m/s with the propeller off, minimizing damage to anything that the Nova F6500 UA may contact.

The Nova F6500 UAS Operator Manual at Chapter 9 “Emergency Procedures” fully describes the features of the Nova F6500 UA and sets forth the unmanned aircraft’s operation in

the event of a power loss, loss of communications, loss GPS, loss of video link, or software crash. A copy of Nova F6500 UAS Operator Manual, which contains proprietary information, is attached hereto as Exhibit A, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

iv. The Nova F6500 Ground Control Station And Its Operation.

A complete description of the operation and specifications of the ground control station (GCS) and flight control software for the Nova F6500 UAS is provided in the Nova F6500 UAS Operator Manual at Chapter 2. A complete overview of the features and operation of the GCS software is provided at Chapter 7. A copy of the Nova F6500 UAS Operator Manual, which contains proprietary information, is attached hereto as Exhibit A, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

v. Safe Mobile Operation Of The Nova F6500 UAS.

The Nova F6500 UAS may be safely operated by a Pilot-in-Command (PIC) and safety observer co-located with a GCS on a mobile vehicle or watercraft, in order to efficiently perform aerial acquisition operations of large areas. As set forth in the Nova Family of Systems Operations Manual at page 6-4, additional limitations and requirements apply to mobile operations of the Nova F6500 UAS, including the following:

The driver/operator of the vehicle must be licensed and fully understand his/her role in the operation.

The mobile vehicle must be organized and clear of any unnecessary debris prior to the operation.

Equipment and personnel positioning within the vehicle must be predetermined and agreed upon by the team. Each team member must use appropriate safety restraint equipment, and such equipment should not interfere with safe flight.

The PIC must have ready communication with the driver/operator of the vehicle as well as the safety observer.

GCS software must be configured for constant updating of GCS position on the map overlay, and the PIC must be kept aware of vehicle position. The GCS must be mounted or fixed to the vehicle to ensure that no excess movement will shift the GCS during operations.

The route of the moving vehicle must be determined prior to operation and the PIC must ensure that no part of the route will obscure the safety observer's view of the vehicle or cause any physical obstacles or obstructions to any member of the flight team.

The Area of Interest (AOI) must be large enough to warrant mobile operations, and the aircraft cannot be allowed to exit the AOI under any circumstance. The only change to the standard operating procedures (SOP's) with mobile operations must be an update of the LOL (Loss of Link) site. Mobile operations are only permitted if suitable LOL sites are within 500 ft. of the PIC at all times. The entire AOI must also meet the "sterile environment" of a static site as described on page 4-4 of the Operations Manual, otherwise mobile operations are prohibited.

A copy of the Nova Family of Systems Operations Manual, which contains proprietary information, is attached hereto as Exhibit B, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

c. Flight Operations Of The Nova F6500 UAS Are Limited To The Line Of Sight Of A Certificated Private Pilot in Command With A Safety Observer.

Altavian will only utilize certificated Private Pilots who possess a valid Airman Medical Certificate to act as a pilot in command of the Nova F6500 UAS. Additionally, a safety observer, who will also possess a valid Airman Medical Certificate, and who has completed a private pilot ground school, and passed the FAA private pilot knowledge test, will assist all pilots. Additionally, both the pilot in command and safety observer must complete the Altavian Nova Operators Course and meet the experience requirements as set forth in the Nova Family of Systems Operations Manual. A copy of the Nova Family of Systems Operations Manual, which contains proprietary information, is attached hereto as Exhibit B, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

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

In seeking this exemption, Altavian proposes to commercially operate the Nova F6500 UAS for the special purpose of conducting aerial acquisitions over the United States, pursuant to the following specific operating limitations:

- 1) Operations authorized by the grant of exemption will be limited to the following aircraft described in the operating documents, which is a fixed-wing aircraft weighing less than 15 pounds: Altavian Nova F6500. Proposed operations of any other aircraft will require a new petition or a petition to amend the grant.
- 2) The Nova F6500 UA may not be flown at an indicated airspeed exceeding 58 knots.
- 3) The Nova F6500 UA must be operated at an altitude of no more than 1,200 feet above ground level (AGL). All altitudes reported to ATC must be in feet.
- 4) The Nova F6500 UA must be operated within visual line of sight (VLOS) of the Pilot in Command (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.
- 5) All operations must utilize a Visual Observer (VO). 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. 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 functions prescribed in the operating documents.
- 6) The operating documents and the grant of exemption must be maintained and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in the exemption and the procedures outlined in the operating documents, the conditions and limitations in the grant of exemption 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 upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to the grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted the exemption, then the operator must petition for 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.

- 7) Prior to each flight, the PIC must inspect the Nova F6500 UAS to ensure it is in a condition for safe flight. If the inspection reveals a condition that affects the safe operation of the Nova F6500 UAS, the Nova F6500 UA is prohibited from operating until the necessary maintenance has been performed and the Nova F6500 UAS is found to be in a condition for safe flight. The Nova F6500 Ground Control Station must be included in the preflight inspection. All maintenance and alterations must be properly documented in the aircraft records.
- 8) Any Nova F6500 UAS 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. The PIC who conducts the functional test flight must make an entry in the Nova F6500 UA aircraft record of the flight.
- 9) In addition to the pre-flight inspection section in the operating documents, the preflight inspection must also account for all discrepancies, i.e. inoperable components, items, or equipment, not already covered in the relevant sections of the operating documents.
- 10) The operator must follow the Nova F6500 manufacturer's UAS aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements.
- 11) The operator must carry out its maintenance, inspections, and record keeping requirements, in accordance with the operating documents. Maintenance, inspection, and alterations must be noted in the aircraft logbook, including total flight hours, description of work accomplished, and the signature of the authorized Nova F6500 maintenance personnel or PIC returning the Nova F6500 to service.
- 12) The operator's Nova F6500 authorized maintenance personnel or PIC must make a record entry in the UAS logbook or equivalent document of the corrective action taken against discrepancies discovered between inspections.
- 13) The operator's Nova F5600 authorized maintenance personnel, PIC and VO must receive and document training referenced in the operating documents.
- 14) The UAS operated under the exemption must comply with all manufacturer System and Safety Bulletins.
- 15) The PIC must possess at least a FAA-issued private pilot certificate and a valid FAA-issued airman medical certificate. The PIC must also meet the flight review requirements specified in 14 C.F.R. 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.
- 16) Prior to operating for hire, the PIC and VO must have successfully completed Altavian's training syllabus as outlined in the operating documents. In addition, the PIC and VO must also have successfully completed annual (recurrent) training in accordance with the operating documents. A record of training must be documented and made available upon request by the Administrator. Training, proficiency, and experience-

building flights for the purpose of training pilots and VOs to conduct flights authorized by the exemption are permitted under the terms of the exemption.

17) If the Nova F6500 UA loses communications or loses its GPS signal, it must return to a pre-determined location within the planned operating area and land, or be recovered in accordance with the operating documents.

18) The PIC must abort the flight in the event of unpredicted obstacles or emergencies pursuant to the operating documents.

19) The operator must obtain an Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA) prior to conducting any operations under the grant of exemption. This COA will also require the operator to request a Notice to Airman (NOTAM) not more than 72 hours in advance, but not less than 48 hours prior to the operation.

20) The Nova F6500 UA operated in accordance with the exemption must be identified by serial number, registered in accordance with 14 C.F.R. part 47, and have identification (N-Number) markings in accordance with 14 C.F.R part 45, Subpart C.

21) Before conducting operations, the radio frequency spectrum used for operation and control of the Nova F6500 UA must comply with the Federal Communications Commission (FCC) or other appropriate government oversight agency requirements.

22) The documents required under 14 C.F.R §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the Nova F6500 UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

23) The Nova F6500 UA must remain clear and yield the right of way to all other aircraft operations and activities at all times.

24) If the Nova F6500 UAS is operated from a moving device or vehicle, the operation must be in accordance with the operating documents.

25) Nova F6500 UAS operations may not be conducted during night, as defined in 14 C.F.R. § 1.1.

26) All operations must be conducted under visual meteorological conditions (VMC). The Nova F6500 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.

27) During operations in the National Airspace System, the UA may not operate within 5 nautical miles of the geographic center of an airport as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airport's management is obtained, and the operation is conducted in accordance with a NOTAM as required by

the operator's COA. The letter of agreement with the airport management must be made available to the Administrator upon request.

28) The Nova F6500 UA may not be operated over congested or densely populated areas. These areas include but are not limited to the yellow areas depicted on World Aeronautical Charts (WAC), Sectional Aeronautical Charts (Sectionals), or Terminal Area Charts (TAC). However, aeronautical charts may not reflect pertinent local information. Ultimately, it is the PIC's responsibility to maintain the minimum safe altitudes required by 14 C.F.R. § 91.119.

29) Operation of the Nova F6500 UA must be conducted at least 500 feet from all persons, vessels, vehicles, and structures not directly involved in the operation.

30) Operations of the UA may be conducted at distances less than 500 feet from participating persons, vessels, vehicles or structures that perform an essential function in connection with the special purpose operations. Operations closer than 500 feet from the PIC, VO, operator trainees and essential persons, are permitted when operationally necessary; but never so close as to present an undue hazard, per 14 C.F.R. § 91.119(a).

31) Operations of the UA may be conducted at distances less than 500 feet from unoccupied vessels, vehicles or structures owned by the land owner/controller when the land owner/controller grants such permission and the PIC makes a safety assessment of the risk from operations closer to these objects.

32) All operations shall be conducted with permission from the land owner/controller or authorized representative. Permission from land owner/controller or authorized representative will be obtained for each flight to be conducted.

33) 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 meeting the requirements of 49 C.F.R. part 830 must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.nts.gov.

2. Reasons Why An Exemption From The Requirements Of Section 91.151(a)(1) Would Not Adversely Affect Safety.

A grant of this exemption would ensure the level of safety established by 14 C.F.R. Section 91.151(a)(1) because the technical specifications of the Nova F6500 UAS, the Nova Operations Manual, and Altavian's proposed operating limitations ensure that Altavian may safely operate the battery powered Nova F6500 UA during daylight hours in VMC for 80 minutes, landing with 10 minutes of battery power remaining. Furthermore, previous

exemptions granted by the FAA concerning Section 91.151(a)(1) establish that safety is not adversely affected when the technical characteristics and operating limitations of a UAS are considered.

The Nova F6500 UA is powered by a Lithium Ion 11 Amp hour, 22.2V battery, and is protected by two low battery failsafes, while the ground control station (GCS) provides a battery indicator on the heads-up display, which indicates the Nova F6500 UA's current remaining battery power measured in volts, providing the PIC with constant awareness of the real-time battery voltage during a flight.

The two low battery failsafes that protect the Nova F6500 UA are a "Low AV² battery" failsafe and a "Critically low AV battery" failsafe. The "Low AV battery" failsafe flies the UA to the location of the ground control station (GCS), or identified Rally point, when the UA battery reaches a certain threshold of time as configured by the operator (or 20.4V). The "Critically low AV battery" shuts the propulsion motor off and lands the UA at its current location. This failsafe is triggered if the battery drops below the critical battery voltage as configured by the operator, or 19.4V.

Furthermore, an exemption from the requirements of Section 91.151(a)(1) would not adversely affect safety because Altavian will only conduct flights during daylight hours in VMC, with the duration of each flight not to exceed 80 minutes, as set forth by the Nova Family of Systems Operations Manual. A copy of the Nova Family of Systems Operations Manual, which contains proprietary information, is attached hereto as Exhibit B, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

² The Nova F6500 UAS Operator Manual defines "AV" as "Aerial Vehicle."

Likewise, as set forth above, Altavian has proposed specific operating limitations in this Petition that will maintain the level of safety established by Section 91.151(a)(1), including the following: (1) the Nova F6500 UA will only be operated during daylight hours (i.e. between the end of morning civil twilight and the beginning of evening civil twilight, as published in the American Air Almanac, converted to local time); (2) Nova F6500 UA will only be operated pursuant to visual flight rules (VFR) in visual meteorological conditions (VMC); and (3) the duration of each flight shall not exceed 80 minutes.

Significantly, previous exemptions granted by the FAA concerning Section 91.151(a)(1) establish that safety is not adversely affected when the technical characteristics and operating limitations of the UAS are considered. Relief has been granted for manned aircraft to operate at less than the minimums prescribed in Section 91.151(a), including Exemption Nos. 2689, 5745, and 10650. Moreover, the FAA has previously granted relief from Section 91.151(a)(1), specific to UAS, in circumstances similar, in all material respects, to those presented herein (e.g. Exemption Nos. 8811, 10808, 10673, 11042, 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110).

3. 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, Altavian 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 Altavian, the manufacturer of the Nova F6500 UAS, 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, Altavian will document and maintain all maintenance records for the Nova F6500 UAS.

Since the Nova F6500 UAS will be inspected as prescribed by the manufacturer's maintenance manual, Altavian will maintain the level of safety established by Sections 91.405(a), 91.409(a)(1), and 91.409(a)(2). The Nova F6500 Maintenance Manual sets forth Scheduled Maintenance Inspection Procedures for each system and component. Inspection intervals for the Nova F6500 UAS include preflight and post flight inspections, as well as scheduled inspections every 25 hours, 50 hours, 75 hours, and 100 hours.

Likewise, the exemption sought will not adversely affect safety because Altavian will perform maintenance, alterations or preventive maintenance on the unmanned aircraft system using the methods, techniques, and practices prescribed by the manufacturer's maintenance manual. The Nova F6500 Maintenance Manual details procedures for each component of the unmanned aircraft, including the components of the propulsion system, avionics system, payload system, fuselage system, wing, and tail.

A copy of the Nova F6500 Maintenance Manual, which contains proprietary information, is attached hereto as Exhibit C, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

Furthermore, the exemption sought would maintain the level of safety established by Sections 91.407, 91.417(a) and 91.417(b) because all maintenance of the Nova F6500 UAS will be performed by Altavian trained technicians, who will document and maintain maintenance records for the Nova F6500 UAS. Altavian trained technicians are qualified to conduct any and all maintenance to ensure the safe operation of the Nova family of UAS, conduct all service inspections, and authorize the use of each vehicle in the Nova family of UAS based upon

completion of appropriate inspections. *See* Nova Family of Systems Operations Manual, Exhibit B, at page 3-4. Pursuant to the Nova Family of Systems Operations Manual and the Nova F6500 Maintenance Manual, a Maintenance Action Form must be completed and saved in the maintenance logs for all maintenance that is performed on the UAS. The procedures for maintaining the maintenance logs for the UAS are fully set forth in the Nova Family of Systems Operations Manual, Exhibit B, at Chapter 5, and the Nova F6500 Maintenance Manual, Exhibit C, at Chapter 5.

Significantly, previous exemptions granted by the FAA concerning Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), 91.417(a) & (b) establish that safety is not adversely affected when the technical characteristics and operating limitations of a UAS are considered. The FAA has previously granted relief specific to UAS in circumstances similar, in all material respects, to those presented herein (e.g. Exemption Nos. 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11112).

4. 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*, Altavian requests that the FAA prescribe special conditions for the intended operation of the Nova F6500 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 §§ 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 over certain rural areas in the United States. 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 Nova F6500 UAS, 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 Altavian's intended operation of the Nova F6500 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 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).

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

The Rules From Which Altavian Seeks Exemption:

Altavian, Inc. seeks exemption from the requirements of 14 C.F.R. Sections 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 Altavian Seeks:

This exemption will permit Altavian, Inc. to commercially operate an Unmanned Aircraft System (UAS) for the purpose of conducting aerial acquisitions and research over certain rural areas of the United States.

G. Any Additional Information, Views, Or Arguments Available To Support Altavian'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, Altavian'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 Nova F6500 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, Altavian 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 Nova F6500 UAS commercially, without an airworthiness certificate, for the limited purpose of conducting aerial acquisitions over certain areas of the United States. 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 Altavian to safely, efficiently, and economically operate the Nova F6500 UAS commercially within the NAS.

WHEREFORE, in accordance with the Federal Aviation Regulations and the FAA Modernization and Reform Act of 2012, Section 333, Altavian respectfully requests that the Administrator grant this Petition for an exemption from the requirements of 14 C.F.R Sections

91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b), and permit Altavian to operate the Nova F6500 UAS for the purpose of conducting aerial acquisitions and research over certain rural areas of the United States.

Dated: December 12, 2014

Respectfully submitted,

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