

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 61.113(a) & (b), 91.7(a), 91.121, 91.151(b), 91.405(a), 91.407(a)(1), 91.409(a)(1)
& (a)(2), AND 91.417(a) & (b) CONCERNING COMMERCIAL OPERATION OF THE
NOVA R8400 UNMANNED AIRCRAFT SYSTEM
PURSUANT TO SECTION 333 OF
THE FAA MODERNIZATION AND REFORM ACT OF 2012 (PUBLIC LAW 112-95)**

Submitted on January 8, 2015

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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 Regulations
COA	Certificate of Authorization
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
GCS	Ground Control Station
GPS	Global Positioning System
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
VTOL	Vertical Takeoff and Landing

SUMMARY

Altavian, Inc. seeks exemption from the requirements of 14 C.F.R §§ 61.113(a) & (b), 91.7(a), 91.121, 91.151(b), 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 R8400 UAS over certain rural areas of the United States for the purpose of conducting aerial acquisitions and research.

BACKGROUND

Unmanned Aircraft System: Altavian Nova R8400 UAS

Altavian seeks an exemption to operate the Altavian Nova R8400 UAS for compensation or hire within the National Airspace System (“NAS”). The Nova R8400 UAS is comprised of a

vertical takeoff and landing (VTOL) Unmanned Aircraft (UA) and a transportable Ground Control Station (GCS). The Nova R8400 UA has a maximum gross weight of approximately 21.4 pounds, while having a diameter of 48 inches, rotorspan of 64 inches, and maximum speed of 16 mph. The Nova R8400 UA is equipped with eight propellers, each being driven by a Lithium Polymer battery powered electric motor.

The Nova R8400 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 R8400 UA.

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 R8400 UAS in the NAS, and for an exemption from the requirements of 14 C.F.R §§ 61.113(a) & (b), 91.7(a), 91.121, 91.151(b), 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 R8400 UAS meets the conditions of Section 333 and therefore, will not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H.

Accordingly, Altavian requests relief from Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 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 manufacturer of the Nova R8400 UAS, will use its technicians to perform maintenance, alterations, or preventive maintenance on the UAS 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 R8400 UAS.

Relief from certain requirements of Section 61.113(a) and (b), entitled *Private pilot privileges and limitations: Pilot in command*, is requested by Altavian to the extent necessary to allow a Pilot in Command (PIC) holding a private pilot certificate and a third-class airman medical certificate, and who has completed the Nova R8400 UAS training and currency requirements, to conduct the proposed UAS operations. Altavian 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.

Altavian seeks relief from Section 91.7(a), entitled *Civil aircraft airworthiness*, because the Nova R8400 UAS does not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H. As such, Altavian submits that it will ensure that the Nova R8400 UAS is in an airworthy condition, prior to every flight, by determining that the UAS is in compliance with the Nova R8400 UAS Operator Manual, the Nova Family of Systems Operations Manual, and the Nova R8400 Maintenance Manual, and that the UA is in condition for safe flight.

Altavian also seeks an exemption from the requirements of Section 91.121, entitled *Altimeter Settings*, as the Nova R8400 UAS is equipped with a barometer and Global Positioning System (GPS) equipment, which ensures that a ground level pressure setting will be established prior to each flight. The Nova R8400 UA's barometer and GPS equipment ensure safety by providing the PIC with adequate information concerning altitude of the UA, above ground level (AGL), as shown on the heads-up display of the GCS.

Additionally, Altavian seeks an exemption from the requirements of Section 91.151(b), *Fuel requirements for flight in VFR conditions*. Altavian submits that safety will not be affected by terminating flights of the battery powered Nova R8400 UA after 20 minutes of continuous flight, which would allow for five minutes (i.e, 20 percent) of battery power remaining.

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 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. Altavian 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. Altavian 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. Altavian Seeks Exemption From The Requirements Of Section 91.151(b).

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

(b) No person may begin a flight in a rotorcraft 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, to fly after that for at least 20 minutes.

5. 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[.]

6. 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[.]

7. 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.

8. 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 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 holding a private pilot certificate and a third-class airman medical certificate, and who has completed the Nova R8400 UAS training and currency 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 (2) The aircraft does not carry passengers or property for compensation or hire.

As set forth more fully below, Altavian submits that an equivalent level of safety will be maintained because no PIC will be allowed to operate the Nova R8400 UAS unless that PIC has

demonstrated, through the Nova R8400 UAS training and currency requirements, that the PIC is able to safely operate the Nova R8400 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, Altavian submits that all flights of the Nova R8400 UAS, conducted by the PIC pursuant to the grant of this Petition (1) will be incidental to Altavian's business; and (2) will not carry passengers or property for compensation or hire.

2. Extent of Relief Altavian Seeks And The Reason Altavian 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 Altavian to determine that the Nova R8400 UAS is in an airworthy condition prior to every flight by ensuring that the UAS is in compliance with the Nova R8400 UAS Operator Manual, the Nova Family of Systems Operations Manual, and the Nova R8400 Maintenance Manual, and that the UA is in condition for safe flight. Copies of the manuals, which contain proprietary information, are attached hereto as Exhibits A, B, and C, respectively, and are to be held in a separate file pursuant to 14 C.F.R. § 11.35(b) .

Altavian seeks the requested relief because the Nova R8400 UAS does not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H. Therefore, Altavian will ensure that the Nova R8400 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 Altavian Seeks And The Reason Altavian Seeks Relief From Section 91.121.

Relief from Section 91.121, entitled *Altimeter settings*, may be required to allow flight operations of the Nova R8400 UAS, which utilizes a barometer and GPS equipment, to ensure that a ground level pressure setting will be established prior to each flight, in order to report altitude to the PIC. Altavian seeks the requested relief because the Nova R8400 UA does not utilize a typical barometric altimeter onboard that may be set as contemplated by Section 91.121. As more fully set forth below, an equivalent level of safety will be maintained since the Nova R8400 UAS is equipped with a barometer and GPS equipment, which will ensure that a ground level pressure setting will be established prior to each flight, and provides the PIC with altitude information of the UA, above ground level (AGL), on the heads-up display of the ground control station (GCS).

4. Extent Of Relief Altavian Seeks And The Reason Altavian Seeks Relief From Section 91.151(b).

Relief from Section 91.151(b), entitled *Fuel Requirements for flight in VFR conditions*, is requested to the extent required to allow flights of the battery powered Nova R8400 UA, during daylight hours in visual meteorological conditions under visual flight rules (VFR), to continue for a total duration of 20 minutes, which will ensure that the UA will land with five minutes (i.e., 20 percent) of battery power remaining. Altavian seeks the requested relief, because without an exemption from Section 91.151(b), the flight time duration of the battery powered Nova R8400 UA will severely constrain the practicality of any aerial acquisition and research flight operations which Altavian proposes to conduct pursuant to this Petition.

Significantly, as set forth below, the technical specifications of the Nova R8400 UAS, the Nova Operations Manual, and Altavian's proposed operating limitations, ensure that Altavian

will safely operate the battery powered Nova R8400 UA during daylight hours in VFR conditions for a total flight duration of 20 minutes, landing with five minutes (i.e., 20 percent) of battery power remaining.

5. 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 R8400 UAS does not require an airworthiness certificate. As set forth more fully below, the Nova R8400 UAS meets the conditions of Section 333 of the FMRA for operation without an airworthiness certificate. Accordingly, Altavian, which manufactures the Nova R8400 UAS, will use Altavian technicians to perform maintenance, alterations, or preventive maintenance on the UAS 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 R8400 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 rural areas of the United States, commercially, in support of government entities, agriculture, scientific studies, wildlife monitoring, forestry operations, and the oil and gas industries. Additionally, use of the Nova R8400 UAS will decrease congestion of the NAS, reduce pollution, and provide significant benefits to the economy. Notably, the benefits of Altavian's proposed operation of the Nova R8400 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 R8400 UAS and perform aerial acquisition and research throughout rural areas of the United States, in support of government entities, agriculture, scientific studies, wildlife monitoring, forestry operations, mining, and the oil and gas industries. The Nova R8400 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 R8400 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 R8400 UAS will be used to predict and increase crop yields, as well as research for the prevention of crop disease. In the oil and gas industry, the Nova R8400 UAS will be used to aid in facility inspections, survey and plan new worksites, conduct volumetric analysis, and perform right of way analysis. The Nova R8400 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 R8400 UAS 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 R8400 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

R8400 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 R8400 UAS.

Conducting aerial acquisitions with the Nova R8400 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 electric motors, the Nova R8400 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 R8400 UAS, while reducing the carbon footprint of aerial acquisitions, also reduces noise pollution, as the UA is propelled by battery powered electric motors, rather than an internal combustion engine.

By using the Nova R8400 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 flightcrew members located onboard the aircraft, the Nova R8400 UA (weighing approximately 21.4 pounds at its maximum gross weight with a diameter of 48 inches, rotorspan of 64 inches, and 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 R8400 UAS Will Benefit The Economy.

In addition to being safe and efficient, the Nova R8400 UAS is also an economical alternative to using manned aircraft to conduct aerial acquisitions. As such, operation of the Nova R8400 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 aviation fuels, U.S. owned and operated companies must adopt new and alternative technology in order to remain competitive. Operating the battery powered Nova R8400 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 R8400 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 R8400 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.

Similar to the manned aerial acquisition flight operations that have been conducted for decades, Altavian’s proposed operation of the Nova R8400 UAS will not implicate any privacy issues. Specifically, the Nova R8400 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 R8400 UA 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 R8400 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 R8400 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 a 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 R8400 UAS can operate safely in the NAS pursuant to FMRA Section 333, as demonstrated by: (a) the characteristics of the Nova R8400 UAS; (b) the pilot certification requirement; and (c) the specific operating limitations.

a. The Specifications Of The Nova R8400 UAS Demonstrate Its Safe Characteristics.

The Nova R8400 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 R8400 UAS.

Unmanned Aircraft System	The Nova R8400 is an Unmanned Aircraft System that is comprised of vertical takeoff and landing (VTOL) unmanned aircraft and a transportable ground control station.
Unmanned Aircraft Dimensions	Diameter: 48 inches Rotorspan: 64 inches
Engine (Propulsive Unit)	<p><u>Engine (Propulsive Unit)</u></p> <p>(8) Altavian Inc. P/N : 30305 (Electric) FAA Engine Type Cert: None Propulsive Unit Type: 25V, 22 Amp Hour capacity, Lithium ion battery powered, direct drive electric motor</p> <p><u>Motor, Electric Sub-Assembly:</u> Manufacturer: T-Motor Model: MN4014 1.6 HP Peak Power Direct Drive</p>

	<p>5.2 oz. Wt.</p> <p><u>Motor, Controller Sub-Assembly:</u> Manufacturer: RCTimer Model: NFS 45A Type: Speed Controller 55 Amps Maximum 1.4 oz. Wt.</p> <p><u>Motor, Battery:</u> Manufacturer: MaxAmps, Inc. Type: 2(two) x Lithium Ion 11 Amp hour each 22.2V (nominal)</p>
Fuel	<p>Not Applicable.</p> <p>NOTE: The Nova R8400 UAS is powered by two Lithium Polymer rechargeable batteries, Altavian P/N 30142.</p>
Engine (Propulsive Unit) Limits	<p>Maximum Power Output: 1.6 HP Maximum RPM: 8,316 RPM 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)</p> <p>Power On (Engine and Rotor Tach, neither visible to operator) Maximum 8316 RPM Minimum 3742 RPM</p>
Propeller and Propeller Limits	<p>(4) Altavian Inc. P/N 30490 FAA Propeller Type Certificate: None Propeller Type: 2-blade, plastic, fixed pitch, tractor</p> <p><u>Propeller Sub-Assembly:</u> Manufacturer: APC Propeller Model: CAM 16x5.5MPR Diameter (Nominal): 16 in.</p> <p>(4) Altavian Inc. P/N 30488 FAA Propeller Type Certificate: None Propeller Type: 2-blade, plastic, fixed pitch, tractor</p>

	<p><u>Propeller Sub-Assembly:</u> Manufacturer: APC Propeller Model: CAM 16x5.5MR Diameter (Nominal): 16 in.</p>
Battery Command & Control	2 (two) Nova Air Vehicle Batteries P/N 30142 power the motors, and battery command and control.
Airspeed Limits	Vne (Never Exceed Speed) 14.5 knots (7.5 m/s)
Empty Weight C.G. Range	-1 to 1 inches of datum
Datum	Centroid of Vehicle
Maximum Weights	Ramp 21.4 lbs. Takeoff 21.4 lbs. Landing 21.4 lbs.
Empty Weight	12.8 lbs. NOTE: Empty Weight Excludes weight of batteries 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 30306

Minimum Crew	(1) The Nova R8400 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
Rotor Blade and Control Movements	Fixed Rotor Control. Vehicle control is achieved through varying thrust of each motor individually
Nominal Endurance	25 minutes above 32 °F (0 °C) 12 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	9.7 knots
Maintenance	This Nova R8400 UAS must be maintained in accordance with the manufacturer's maintenance manual, or later FAA accepted revision.

ii. The Nova R8400 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 R8400 UAS is provided in the Nova R8400 UAS Operator Manual at pages 7-1 through 7-

3. A copy of the Nova R8400 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 R8400 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 R8400 UA is designed for complete autonomy from launch to landing with a line of sight operator in the loop monitoring the airframe.

The Nova R8400 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 R8400 UA will attempt to reacquire the link. If after 10 seconds the link has not been reacquired, the Nova R8400 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 R8400 UA will hover while continuing its attempt to reacquire the link for 30 seconds (to allow for rebooting of the ground control station, if needed). The Nova R8400 UA will then continue to attempt to re-acquire the link while it navigates through the landing procedure.

The landing procedure for Lost Link is identical to a normal landing procedure. The Nova R8400 UA will enter into a hover-land procedure; descending while reducing speed until contact with the ground. During this decent and touchdown, the Nova R8400 UA will remain in controlled flight.

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).

Loss of GPS signal will result in a two-tiered recovery approach. Upon loss of a GPS signal, the Nova R8400 UA will immediately hover in an attempt to reacquire a signal. If after 15 seconds, a GPS signal is not reacquired, the UA will enter tier-two recovery. At any time during either tier-one or tier-two recovery, 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 recovery, the Nova R8400 UA will enter into a hover-land procedure; descending while reducing speed until contacting the ground. Throughout this descent and touchdown, the Nova R8400 UA will remain in controlled flight.

The Nova R8400 UAS Operator Manual at Chapter 8 “Emergency Procedures” fully describes the features of the Nova R8400 UAS, and sets forth the UA’s operation in the event of a power loss, loss of communications, loss of GPS signal, loss of video link, or software crash. A copy of Nova R8400 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 R8400 Ground Control Station And Its Operation.

The Nova R8400 Ground Control Station is identical to the GCS utilized by the Altavian Nova F6500 UAS, which has been granted exemptions to operate commercially in the NAS. *See* Exemption Nos. 11111 and 11114. A complete description of the operation and specifications of the ground control station (GCS) and flight control software for the Nova R8400 UAS is

provided in the Nova R8400 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 R8400 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 R8400 UAS.

The Nova R8400 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 R8400 UAS, including the following:

The driver/operator of the mobile 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 mobile 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 mobile vehicle position. The GCS must be mounted or fixed to the mobile vehicle to ensure that no excess movement will shift the GCS during operations.

The route of the mobile vehicle must be determined prior to operation. The PIC must ensure that no part of the route will obscure the safety observer's view 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 UA 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).

b. Flight Operations Of The Nova R8400 UAS Are Limited To The Line Of Sight Of A Certificated Pilot in Command With A Safety Observer.

Altavian will only utilize certificated pilots who possess a valid airman medical certificate to act as a pilot in command (PIC) of the Nova R8400 UAS. Additionally, a safety observer will assist all pilots. Both the PIC 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).

c. Flights Of The Nova R8400 UAS Will Be Conducted Pursuant To Specific Operating Limitations.

In seeking this exemption, Altavian proposes to commercially operate the Nova R8400 UAS for the special purpose of conducting aerial acquisitions over rural areas of 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 an eight-rotor, vertical takeoff and landing, unmanned aircraft weighing less than 15 pounds (maximum weight: 21.4 pounds): Altavian Nova R8400. Proposed operations of any other aircraft will require a new petition or a petition to amend the grant.

2) The Nova R8400 UA may not be flown at an indicated airspeed exceeding 14.5 knots.

- 3) The Nova R8400 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 R8400 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 R8400 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 R8400 UAS, the Nova R8400 UA is prohibited from operating until the necessary maintenance has been performed and the Nova R8400 UAS is found to be in a condition for safe flight. The Nova R8400 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 R8400 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 R8400 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 R8400 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 R8400 maintenance personnel or PIC returning the Nova R8400 UAS to service.
- 12) The operator's Nova R8400 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 R8400 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 R8400 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 in accordance with 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 R8400 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 flight operations, the radio frequency spectrum used for operation and control of the Nova R8400 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 R8400 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 R8400 UA must remain clear and yield the right of way to all other aircraft operations and activities at all times.

24) If the Nova R8400 UAS is operated from a moving device or vehicle, the operation must be in accordance with the operating documents.

25) Nova R8400 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 R8400 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 R8400 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 R8400 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 61.113(a) And (b) Would Not Adversely Affect Safety.

Altavian 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 Nova R8400 UAS unless that PIC has demonstrated, through the Nova R8400 UAS training and currency requirements, that the PIC is able to safely operate the Nova R8400 UAS in a manner consistent with this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from people, vessels, vehicles and structures.

Considering Altavian'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 Nova R8400 UAS, Altavian submits that the additional manned airmanship experience of a commercially certificated pilot would not correlate to the airmanship skills necessary for Altavian's specific proposed flight operations.

Additionally, the FAA has previously granted relief from Section 61.113(a) and (b) 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, 11136, 11138).

As in Exemption No. 11109, Altavian will not allow any PIC to operate the Nova R8400 UAS unless that PIC has demonstrated through the Nova R8400 UAS training and currency requirements that the PIC is able to safely operate the Nova R8400 UAS in a manner consistent with this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from people, vessels, vehicles and structures.

A complete description of the Nova R8400 UAS Training and Qualification requirements is set forth at pages 3-5 through 3-6 of the Nova Family of Systems Operations Manual, attached hereto as Exhibit B. Exhibit B contains proprietary information and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

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, Altavian will ensure that the Nova R8400 UAS is in an airworthy condition and safe for flight based upon the Nova R8400 UAS's compliance with its operating documents (i.e., the Nova R8400 UAS Operator Manual, the Nova Family of Systems Operations Manual, and the Nova R8400 Maintenance Manual) and as stated in the conditions and limitations herein.

Additionally, the FAA has previously granted relief from Section 91.7(a), 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, 11136, 11138).

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 Nova R8400 UAS is equipped with a digitally encoded barometric altimeter and GPS triangulation equipment, with a zero altitude initiation point being established prior to each flight. As such, the PIC on the Nova R8400 UAS is provided the altitude of the UA above ground level (AGL) via a heads-up display of the ground control station (GCS). Specifically, the PIC of the Nova R8400 UAS is provided three different types of altitude information:

(1) Desired Altitude, indicating the commanded altitude, located at the top right corner of HUD as well as above the HUD; (2) Altitude Above Ground Level (AGL), indicating actual altitude relative to height above launch level on the ground, located in the center of the right side of the HUD; and (3) Climb Rate, indicating the current rate of climb, located in the center of the right side of the HUD. Accordingly, the PIC of the Nova R8400 UAS will be provided with all of the necessary altitude information necessary to maintain safe operation of the UA in the NAS. The FAA has previously granted relief from Section 91.121 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, 11112, 11136, 11138).

5. Reasons Why An Exemption From The Requirements Of Section 91.151(b) Would Not Adversely Affect Safety.

A grant of this exemption would ensure the equivalent level of safety established by 14 C.F.R. Section 91.151(b) because the technical specifications of the Nova R8400 UAS, the Nova Operations Manual, and Altavian's proposed operating limitations will ensure that Altavian may safely operate the battery powered Nova R8400 UA during daylight hours in VFR conditions for a total flight duration of 20 minutes, which will ensure a landing with five minutes (i.e., 20

percent) battery power remaining. Furthermore, previous exemptions granted by the FAA concerning Section 91.151(b) establish that safety is not adversely affected when the technical characteristics and operating limitations of a UAS are considered.

The Nova R8400 UA is powered by two Lithium Ion 11 Amp hour, 22.2V batteries, and is protected by two low battery failsafes. The ground control station (GCS) provides a battery indicator on the heads-up display, which indicates the Nova R8400 UA's current remaining battery power measured in volts, and thus provides the PIC with constant awareness of the real-time battery voltage during a flight.

The two low battery failsafes that protect the Nova R8400 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 batteries reach a certain threshold of time as configured by the operator, or 22.2V. The "Critically low AV battery" failsafe lands the UA at its current location. This failsafe is triggered if a battery drops below the critical battery voltage as configured by the operator, or 21.2V.

Furthermore, an exemption from the requirements of Section 91.151(b) 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 20 minutes, with five minutes (i.e., 20 percent) battery power remaining.

Likewise, as set forth above, Altavian has proposed specific operating limitations in this Petition that will maintain the equivalent level of safety established by Section 91.151(b), including the following: (1) the Nova R8400 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

² The Nova R8400 UAS Operator Manual defines "AV" as "Aerial Vehicle."

published in the American Air Almanac, converted to local time); (2) Nova R8400 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 20 minutes.

Significantly, previous exemptions granted by the FAA concerning Section 91.151 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, including Exemption Nos. 2689, 5745, and 10650. Moreover, the FAA has previously granted relief from Section 91.151, 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, 11136, 11138).

6. Reasons Why An Exemption From The Requirements Of Sections 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 an equivalent 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), and 91.417(a) & (b) will be met because Altavian, the manufacturer of the Nova R8400 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 R8400 UAS.

Since the Nova R8400 UAS will be inspected as prescribed by the manufacturer's maintenance manual, Altavian will maintain the equivalent level of safety established by Sections 91.405(a), 91.409(a)(1), and 91.409(a)(2). The Nova R8400 Maintenance Manual sets

forth Scheduled Maintenance Inspection Procedures for each system and component. Inspection intervals for the Nova R8400 UAS include preflight and post flight inspections, as well as scheduled inspections every 25 hours, 50 hours, 75 hours, and 100 hours of operation.

Likewise, the exemption sought will not adversely affect safety because Altavian will perform maintenance, alterations or preventive maintenance on the UAS using the methods, techniques, and practices prescribed by the manufacturer's maintenance manual. The Nova R8400 Maintenance Manual details procedures for each component of the UA, including the components of the propulsion system, legs/arms, avionics system, and payload system.

A copy of the Nova R8400 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 an equivalent level of safety established by Sections 91.407, 91.417(a) and 91.417(b) because all maintenance of the Nova R8400 UAS will be performed by Altavian trained technicians, who will document and maintain maintenance records for the Nova R8400 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 R8400 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 R8400 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, 11136, 11138).

7. 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 R8400 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 §§ 61.113(a) & (b), 91.7(a), 91.121, 91.151(b), 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 UA for the limited purpose of conducting aerial acquisitions over certain rural areas of 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 UAS in the NAS.

Likewise, the Administrator may prescribe special conditions pursuant to 14 C.F.R.

§ 21.16, for operation of the Nova R8400 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 R8400 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(b), 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 61.113(a) & (b), 91.7(a), 91.121, 91.151(b), 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, Altavian will operate the Nova R8400 UAS 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 R8400 UAS commercially, without an airworthiness certificate, for the limited purpose of conducting aerial acquisitions over certain rural 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 R8400 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

61.113(a) & (b), 91.7(a), 91.121, 91.151(b), 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 R8400 UAS for the purpose of conducting aerial acquisitions and research over certain rural areas of the United States.

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Respectfully submitted,

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