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

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

August 6, 2015

Exemption No. 12363
Regulatory Docket No. FAA–2015–1533

Ms. Kelly Neubecker
UASolutions Group, Inc.
Counsel for Homeland Surveillance and Electronics, LLC
2518 Auburn Drive
Cocoa, FL 32926

Dear Ms. Neubecker:

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

By letter dated April 24, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Homeland Surveillance and Electronics, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct inspections, aerial mapping, surveying, product demonstration, and product training[1].

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

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

[1] The petitioner requested authority to conduct UAS training. At this time, the FAA is unable to authorize UAS operations for training until a further assessment is completed. When the FAA completes its review, we will proceed accordingly and no further action will be required by the petitioner. However, the petitioner is permitted to train its own pilot in commands and visual observers in accordance with condition no. 14 and the other conditions and limitations in this exemption.

Airworthiness Certification

The UAS proposed by the petitioner are the Leptron Avenger and Leptron RDASS.

In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

You have requested to use a UAS for aerial data collection[2]. 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, Homeland Surveillance and Electronics, LLC is

[2] Aerial data collection includes any remote sensing and measuring by an instrument(s) aboard the UA. Examples include imagery (photography, video, infrared, etc.), electronic measurement (precision surveying, RF analysis, etc.), chemical measurement (particulate measurement, etc.), or any other gathering of data by instruments aboard the UA.

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, Homeland Surveillance and Electronics, LLC is hereafter referred to as the operator.

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

1. Operations authorized by this grant of exemption are limited to the Leptron Avenger and Leptron RDASS when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

2. Operations for the purpose of closed-set motion picture and television filming are not permitted.

3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.

4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude must be reported in feet AGL.

5. The UA must be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate or U.S. driver's license.

6. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. The VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents, the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS−80) may be contacted if questions arise regarding updates or revisions to the operating documents.

8. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g., replacement of a flight critical component, must undergo a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.

9. The operator is responsible for maintaining and inspecting the UAS to ensure that it is in a condition for safe operation.

10. Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, e.g., inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.

11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.

12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.

13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.

16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.

17. The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.

18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.

19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.

20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the

intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.

21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The exemption holder may apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N−Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.

23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

24. The UA must remain clear and give way to all manned aviation operations and activities at all times.

25. The UAS may not be operated by the PIC from any moving device or vehicle.

26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
    a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and
    b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

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

27. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative. Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.

28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS−80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

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

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.

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

31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

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

This exemption terminates on August 31, 2017, unless sooner superseded or rescinded.

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

Enclosures

UASolutions Group, Inc.
2518 Auburn Drive, Cocoa FL 32926
Tel: (321) 261-2547

Kellyneubecker@uasolutionsgroup.com

April 24, 2015

U.S. Department of Transportation, Docket Operations
West Building Ground Floor, Room W12-140
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: Petition for an Exemption to Conduct Small Unmanned Aircraft Systems (sUAS) Operations Allowed by Section 333 of the Federal Aviation Administration Modernization and Reform Act of 2012, 49 U.S.C. § 44701(f), and 14 C.F.R. Part 11

A. Summary

On behalf of our clients, Homeland Surveillance & Electronics, LLC, and pursuant to Section 333 of the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012 ("FMRA"), Subsection (f) of 49 U.S.C. § 44701, and 14 C.F.R. Part 11, Homeland Surveillance & Electronics, LLC ("HSE-UAV"), (hereafter known as the "Petitioner"), an operator and distributor of Unmanned Aircraft Systems ("UAS"), seeks exemption from the following listed Code of Federal Regulations ("CFR") to allow commercial operation of the Leptron Avenger ("Avenger") within the National Airspace System (NAS) for controlled, low-risk, aerial mapping, surveying, product demonstration flights for potential customers, product training for potential customers, research and development, and structural inspections, conducted within and under the conditions outlined herein, or as may be established by the FAA, as required by Section 333 requirements.

As described more fully below, the requested exemption would permit the operation of the Leptron Avenger sUAS by Petitioner under controlled conditions in predetermined airspace that is 1) Limited in scope 2) Controlled as to access by mission essential personnel only and 3) Provides improved safety controls and efficiency to industries presently using conventional

aircraft. Approval of this exemption would thereby enhance safety and fulfill the Secretary of Transportation's (the FAA Administrator's) responsibilities to "…establish requirements for the safe operation of such aircraft systems in the national airspace system" as stated within Section 333(c) of the FMRA. In making this determination, the Secretary is required to determine which types of sUAS do not create a hazard to users of the NAS or the public or pose a threat to national security in light of the aircraft's size, weight, speed and operational capability; Operation of the sUAS in close proximity to airports and population centers; Operation of a sUAS within visual line of sight of the operator.

Grant of the requested exemption is in the public interest based upon the concise direction expressed within section 333 of the reform act; the added authority granted by the Act, as amended; an equivalent level of safety regarding flight operations as expressed herein, and significant cost savings achieved by transitioning from traditional manned aerial resources to sUASs. The petitioner respectfully requests that the FAA grant the requested exemption without delay. Petitioner will operate the Leptron Avenger sUAS while keeping the documents required by the regulations at the ground control station and immediately accessible to the Pilot in Command (PIC) and by modification of the required markings (registration number) of the sUAS to be displayed on the fuselage of the unmanned aircraft.

The name and address of the Petitioner is:

Homeland Surveillance & Electronics, LLC.

The primary contact for this petition, with a copy to me at the address above is:

David Sanders
546 Business Park Dr.
Medford, OR 97504

B. Regulations – Exemptions Requested

a. 14 C.F.R. 45.27(a),
b. 14 C.F.R. 61.113(a) and (b),
c. 14 C.F.R. 91.7(a),
d. 14 C.F.R. 91.105,
e. 14 C.F.R. 91.119(c)
f. 14 C.F.R. 91.121,
g. 14 C.F.R. 91.151(b),
h. 14 C.F.R. 91.405(a),
i. 14 C.F.R. 91.407(a)(1),

j. 14 C.F.R. 91.409(a)(1) and (2), and
k. 14 C.F.R. 91.417(a) and (b).

C. Corporate Background

HSE-UAV is a leader in "Made in America" remotely piloted UAS. HSE-UAV platforms include the most sophisticated features, are manufactured to be durable, and are the easiest to use systems on the market. Additionally, HSE-UAV strives for innovative power cell technology with improved power, performance, longevity and superior weight standards for UAS. HSE-UAV helicopters are designed for maximum flight time with minimum down time. The team of professionals stand ready to design the right UAS and platform to meet law enforcement and first responder needs, as well as complete training and a maintenance package to keep the UAS ready when the need arrives. HSE-UAV also has the operational infrastructure to provide aerial mapping, surveying, product demonstration flights, product training, research and development, and structural inspection for numerous customers in different geographical locations throughout the Unites States in a safe, convenient, and legal manner.

HSE-UAV's sUAS for the purposes of this petition is the Leptron Avenger. The Avenger has a maximum gross takeoff weight of approximately 35 pounds or less, depending upon payload, with a wingspan of 72.5 inches, a length of 83.93 inches, and a height of 21 inches with standard gear. The Avenger is equipped with a single rotor driven by a lithium polymer battery powered 10,000 Watt electric main motor and a 2,200 watt tail motor. HSE-UAV will operate only within visual line of sight (VLOS) and during daylight hours in Visual Flight Rules (VFR) conditions. Additionally, HSE-UAV will operate only within the parameters defined in the blanket Certificate of Authorization (COA) issued by the FAA under the new interim policy. In the event any HSE-UAV operation exceeds the 200-foot limitation imposed by the policy, a separate COA specific to the airspace required for that operation will be obtained prior to flight operations. Such requirements will insure that the sUAS will "not create a hazard to users of the national airspace system or the "public" as stated in Section 333 of the FMRA.

D. Airworthiness

A critical element of consideration for grant of the petition is evidence of an equivalent level of safety for airworthiness of the sUAS. The FAA has been authorized to exempt aircraft from the requirement for an actual airworthiness certificate in accordance with the statutory criteria provided in Section 333 of PL 112-95 in reference to 49 USC 44704, in consideration of

the size, weight, speed, and limited operating area associated with the aircraft and its operation. However, in accordance with FAA N 8900.291, Petitioner has an established inspection and maintenance program for the continued airworthiness of the aircraft in accordance with the manufacture's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.

E. Leptron Avenger Summary

1. LEPTRON AVENGER

Petitioner seeks an exemption to operate the Leptron Avenger for limited approved commercial purposes within the NAS[1]. The Avenger is a sUAS that is comprised of an airborne unmanned aircraft and a transportable ground station. The Avenger has a maximum gross takeoff weight of approximately 35 pounds or less, depending upon payload, with a wingspan of 72.5 inches, a length of 83.93 inches, and a height of 21 inches with standard gear. The Avenger is equipped with a single rotor driven by a lithium polymer battery powered 10,000 Watt electric main motor and a 2,200 watt tail motor.

[1] Petitioner will submit additional Aircraft Registration Applications as required, upon the grant of the exemptions sought by this petition.

2. Proven Operational History of the Leptron Avenger in the NAS.

The Leptron Avenger is acquiring substantial system maturity. It is currently operating safely within the NAS pursuant to approximately fourteen (14) COAs granted by the FAA to Arlington Texas Police Department, Central Michigan State University, Texas A&M University and New Mexico State University.

Petitioner proposes that requirements should take into account the characteristics of the particular sUAS. The Avenger is characterized by a high degree of pre-programmed control, various built-in technical capabilities that limit the potential for operation outside of the operating conditions as set forth below, and many built-in functional, safety and redundancy features to ensure a safe and reliable operation.

In support of these characteristics, and to provide the details for review by the FAA, Petitioner submits the following documents and manuals as attachments to this exemption request as a set of Confidential Documents under 14 CFR 11.35(b) as each document and manual contains proprietary information that the applicant has not and will not share with others. The documents and manuals contain specifications, operating conditions and procedures, maintenance procedures and a safety management program that are not available to the public and are protected from release under the Freedom of Information Act 5 USC 552 et.seq.

- Leptron Avenger B Flight Operation's Manual (FOM) and Center of Gravity Overview
- HSE- UAV Standard Operating Procedures (SOP) with checklists
- Leptron Avenger B Training Manual
- HSE-UAV Inspection and Maintenance Manual

F. Regulatory Basis for Petition

Petitioner, pursuant to 14 C.F.R. §§ 11.61(b), 11.81, [2] and the FAA Modernization and Reform Act of 2012 ("FMRA"), Section 333, *Special Rules for Certain Unmanned Aircraft Systems* ("Section 333"), hereby respectfully petitions the Administrator for an exemption from the requirements of 14 C.F.R. §§, 45.27(a), 61.113(a) and (b), 91.7(a), 91.105, 91.119(c), 91.121, 91.151 (b), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), 91.417(a) and (b).

[2] 14 C.F.R. § 11.61(b) ("Using a petition for exemption, you may ask FAA to grant you relief from current regulations in 14 C.F.R."), 14 C.F.R. § 11.81 ("What information must I include in my petition for an exemption")?

1. Section 333

Congress identifies Section 333 of the FMRA, as a pathway for "expedited operational authorization" of certain sUAS in the NAS. Section 333 (b)(1) ("expedited operational authorization.").[3] Under Section 333 Congress mandates that the FAA "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" (Section 333(a)) upon consideration of its "size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight." Section 333(b)(1). If the FAA makes such a determination, the FAA "shall [also] establish requirements for the safe operation." Section 333(c). The FAA further may find that the sUAS does not require "airworthiness certification under section 44704 of title 49, United States Code." Section 333(b)(2).

2. 49 U.S.C. § 44701

The FAA is further authorized to grant exemptions from its safety regulations and minimum standards under 49 U.S.C. § 44701 ("Section 44701") "if the Administrator finds the exemption is in the public interest." Section 44701(f)[4] (authorizing the grant of exemptions from safety regulations and minimum standards under Section 44701(a) and (b) and Sections 44702-44716).[5]

For the reasons addressed herein, this Petition qualifies for expedited approval of Petitioner's request for exemption under both Section 333 of the FMRA and 49 U.S.C § 44701.

G. Leptron Avenger Statutory Criteria for Exemption under Section 333

Given its small size, light weight, slow speed, limited load capacity, superior operational capabilities, and that the operations will be conducted only during the day, under visual meteorological conditions ("VMC"), within VLOS of the PIC, with the assistance of a visual

[3] *See also* www.faa.gov/sUAS/legislative_programs/section_333/ (noting that Section 333 grants the FAA "the statutory flexibility to expedite requirements for the safe operation of certain aircraft systems in the NAS.").

[4] Under 49 U.S.C. § 44701(f), the "Administrator may grant an exemption from a requirement of a regulation prescribed under subsection (a) or (b) of this section or any of sections 44702-44716 of [Title 49] if the Administrator finds the exemption is in the public interest."

[5] *See e.g.* 49 USC §44711(a)(1) prohibiting operations without airworthiness certificate; (2) prohibiting serving as airman without airman's certificate; (5) prohibiting commercial operations in violation of regulations); 49 USC §44704 (issuance of airworthiness certificate); 14 C.F.R. §91.203 (a)(1) (carry airworthiness certificate)).

safety observer ("VO"), and confined within the boundaries of a consenting landowner's property and not in the proximity of airports or populated areas, the Leptron Avenger is the very category of sUAS that qualifies for expedited approval under Section 333.

1. Section 333(b)(1) Criteria

a. Size

The Leptron Avenger measures approximately 19.75 inches in height and 58 inches wide, with a wingspan of 72.5 inches.

b. Weight

The Leptron Avenger has a maximum gross weight of 35 lbs.

c. Speed

The Leptron Avenger has a maximum autopilot limited speed of approximately 12 Meters per second (M/S) (24 KTS). However, Petitioner typically operates the aircraft at below 10 M/S (20 KTS).

d. Operational Capability

The Leptron Avenger was specially designed for high or low altitude surveillance, photography, and sensor management. Supported by electric batteries that are rechargeable, the Avenger can fly from 20 – 60 minutes (*depending upon atmospheric conditions) and carry a variety of cameras or sensors. Other Operational metrics of the Avenger are as follows:

Unmanned Aircraft System	The Leptron Avenger is a sUAS that is comprised of an unmanned aircraft (UA) and a transportable ground station.
Serial No.	LEP 822
Unmanned Aircraft Dimensions	Rotor Diameter: 72.25 in. Length: 83.93 in.

Engine (Propulsive Unit)	Engine (Propulsive Unit) The aircraft uses a 10,000 Watts electric main motor and a 2,200 watt tail motor. FAA Motor Type Certificate: None Electric-powered propulsion systems. a. Type of Motor - 395 KV Electric Main, 900 KV Electric tail b. Current draw range – Total System current draw cruise = 30 Amps and Max total system current draw = 360 Amps *c.* All electrical demands are derived from the unmanned aircraft's battery system. Make: LEPTRON-AVGR Model: 1000
Fuel	Not Applicable. NOTE: The Leptron Avenger sUAS is powered by a lithium polymer rechargeable battery.
Engine (Propulsive Unit) Limits	Engine (Propulsive Unit) The aircraft uses a 10,000 Watts electric main motor and a 2,200 watt tail motor. FAA Motor Type Certificate: None Electric-powered propulsion systems. a. Type of Motor - 395 KV Electric Main, 900 KV Electric tail b. Current draw range – Total System current draw cruise = 30 Amps and Max total system current draw = 360 Amps c. All electrical demands are derived from the unmanned aircraft's battery system. Make: LEPTRON-AVGR Model: 1000
Propeller and Propeller Limits	FAA Propeller Type Certificate: None Propeller Type: 2-blade, hinged (folding), carbon fiber reinforced plastic, fixed pitch, tractor Diameter (Nominal): 17.25 in.
Battery Command & Control	Thunder Power Air Vehicle Battery P/N Leptron 6S powers the motor, and battery command and control.

Airspeed Limits	Vne (Never Exceed Speed) 12 m/s Vno (Maximum Structural Cruising Speed) 48 knots (25 m/s) Va (Maneuvering Speed) 12 m/s knots (25 m/s) Landing Speed: VTOL – Vertical 1.5 M/s
Empty Weight C.G. Range	3-3.5 inches for or aft of datum
Datum	Center of main rotor shaft
Mean Aerodynamic Chord (MAC)	NA
Leveling Means	Not Applicable.
Maximum Weights	14.52 KG (35 lbs)
Empty Weight	4.99 KG (11 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 – UTC Aerospace Cloud Cap Technologies
Minimum Crew	(1) The Leptron [model] sUAS can be operated by a single operator
Number of Seats	(0) Not Applicable
Fuel Capacity	Not Applicable
Oil Capacity	Not Applicable
Max. Operating Altitude	1,000 ft. AGL (304 M)
Control Surface Movements	MAIN ROTOR – VARIABLE PITCH +/-5 TAIL ROTOR – VARIABLE PITCH +12/-12°
Nominal Endurance	30 minutes above 32 °F (0 °C) 15 minutes below 32 °F (0 °C)
Ambient Outside Air Temperature (OAT)	Maximum OAT: 120 °F (49 °C) Minimum OAT At Altitude: 0°F
Wind Limitation	40 MPH
Maintenance	This Leptron Avenger must be maintained in accordance with the Leptron Inspection and Maintenance Manual, or later FAA accepted revision.

2. Proximity to Airports/Population Centers or Areas

Flight operations pursuant to this Petition will be tightly controlled and restricted to low risk areas and in accordance with the blanket 200-foot COA requirements at an altitude of no

more than 200 feet above ground level (AGL). In the event an HSE-UAV operation is required to exceed the 200-foot limitation imposed by the policy, a separate COA specific to the airspace required for that operation will be obtained prior to operations at an altitude of no more than 400 feet AGL. All altitudes reported to ATC will be in AGL when required and any operations conducted within 5 nautical miles (NM) of the geographic center of a non-towered airport will obtain a Letter of Agreement with the appropriate airport management and made available to FAA upon request. In addition, access to any property will be limited to persons associated with and necessary to flight operations.

3. Visual Line-of-Sight

The minimum crew for each operation will consist of a PIC and VO. The VO will be used as an additional mitigation to satisfy the VLOS requirement, but the PIC will always maintain VLOS with the sUAS. The Leptron Avenger will at all times be flown by Petitioner only in the daytime (not at night) under VMC, within VLOS of the PIC, with the further assistance of the VO with whom the PIC will have the ability for direct and continuous two-way verbal communications[6] so as to ensure that the flight operations remain within the PIC's VLOS and prescribed flight boundaries and de-conflict with objects in the air and on the ground. Thus, pursuant to the FAA Order 8900.1 Volume 16, Chapter 1, Section 3, the proposed operations will provide an approved method of control and collision avoidance to satisfy the "see and avoid" requirement of 14 C.F.R. § 91.113:
Only qualified and current PIC's and VOs, as provided in the SOP will be used.

4. Other Factors

a. Leptron Avenger Safety Systems

Including as noted above, the Avenger sSUAS is replete with MechaniSafety Operations Procedures to ensure safe operations and protect persons and property on the ground. In addition to having an experienced operator/PIC and VO, the Avenger sSUAS has a variety of integrated safety systems, including:

- Redundant Communications: The Avenger has two (2) simultaneous communications links that allow for backup and safe operations. This

[6] [PIC and VO are within speaking distance and all communications between PIC and VO will be without communications equipment]

includes a 2.4 GHz wireless hand held radio and a 900 MGhz laptop ground station link. Both links must be terminated to execute a 'Lost Communication' return home logic.

- Flight Plan Altitude Constraints: The Avenger has the ability for the operators to set Maximum and Minimum flight altitudes for a specific flight 'corridor' for safe operations.

- Flight Safety Logic: The Avenger has the ability for the operators to set safety return logic including: Exceeding a pre-set flight timer, Loss of GPS, Loss of Communications, Max and Min Altitude, and Low Voltage. The Avenger is also equipped with Geo-fencing logic, capable of restricting it within pre-programmable flight boundaries. This may be accomplished by setting permanent borders on the ground station or setting additional temporary files after the flight has begun. Additional features include fencing off buildings, trees, power lines, poles, etc.

- Ground Station Warnings: The Avenger Ground Station has many visual operator cues for error conditions such as low Relative Signal Strength Indicator (RSSI) strength, low battery, low RPM, low system parameters, and many other real time conditions. The system also offers color-coded 'Dashboard' lights for the operator.

- Double Entry – The Avenger Ground Station has double entry response window for all in-flight parameter changes. This allows the user to not send incorrect information without two verification mouse clicks.

b. Safety Management System

A Safety Management System ("SAFETY OPERATIONS PROCEDURES") will regulate Petitioner's operation of the Avenger and will significantly contribute to maintaining the level of safety contemplated by the airworthiness certificate requirements from which Petitioner now seeks relief.

Pursuant to the SAFETY OPERATIONS PROCEDURES and 14 C.F.R. § 43.13, entitled *Performance Rules (general)*, each person performing maintenance, alteration, or preventive maintenance on the Avenger, motor, propeller, or appliance shall use the methods,

techniques, and practices prescribed in the current manufacturer's Inspection and Maintenance Manual or Instructions for Continued Airworthiness prepared by its manufacturer, or other methods, techniques, and practices acceptable to the Administrator. Each person shall use the tools, equipment, and test apparatus necessary to assure completion of the work in accordance with accepted industry practices.

Petitioner proposes that requirements should take into account the characteristics of this particular sUAS. The Leptron Avenger is characterized by a high degree of pre-programmed control, various built-in technical capabilities that limit the potential for operation outside of the operating conditions as set forth below, and many built-in functional, safety and redundancy features to ensure a safe and reliable operation. At a minimum: geo-fencing at a maximum ceiling of 200'or 400' AGL, flight programming capabilities, a flight termination link available to the operator to prevent a "fly away," and safe abort procedures. The Leptron Avenger will have markings identifying the serial number and identification (N-number) markings as large as practicable. Further, HSE-UAV operations will comply with all manufacturer Safety Bulletins.

c. Flight Operation Limitations and Safety

To ensure consistent safety operations, Petitioner has developed a SOP Manual based upon procedures, notices and guidance the FAA has provided to obtain exemption under Section 333, (submitted on a proprietary and confidential basis to the FAA).

In seeking this exemption, Petitioner proposes to operate the Leptron Avenger pursuant to the following specific operating limitations:

1. The Leptron Avenger shall only be operated at or below 200 ft AGL, unless a separate COA specific to the airspace required for that operation is obtained prior to operations at an altitude of no more than 400 feet AGL.
2. The Leptron Avenger shall be operated within VLOS of the PIC and safety VO.
3. The Leptron Avenger shall be operated pursuant to Day Visual Flight Rules (VFR) in visual meteorological conditions (VMC). The Leptron Avenger shall be operated only 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).
4. The radio frequencies used for operations and control of the UAS (2.4GHz) will comply with the Federal Communications Commission ("FCC") or other appropriate government oversight agency requirements.

5. The Leptron Avenger shall operate from on-site takeoff/landing locations directly next to the PIC and co-located VO. The PIC and the VO shall be able to verbally communicate during all operations.
6. Operations shall be conducted by certificated airmen who possess either a commercial, private, recreational, or sport pilot certificate.
7. The PIC will be a FAA licensed airman and will hold a current airman medical certificate or valid U.S. driver's license issued by a state, the District of Colombia, Puerto Rico, a territory, a possession, or the Federal government. The PIC will 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.
8. The PIC shall have successfully completed the training and qualification process as specified in the Leptron Avenger Pilot Training Guide. PIC qualification flight hours and currency will be logged in a manner consistent with 14 CFR § 61.51(b). Training operations will only be conducted during dedicated training sessions.
9. A minimum of three take-offs and three landings in the preceding 90 days will be required by the PIC to maintain currency, such log of which shall be made available to the Administrator upon request.
10. The PIC and VO will have been trained in the operation of sUAS generally and received up-to-date information on Leptron Avenger operations.
11. All operations will utilize a VO. The UA will be operated within the 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 will be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC will be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC will ensure that the VO can perform the duties required of the VO.
12. The UA will 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.
13. If a pilot certificate holder other than the PIC, who possesses the necessary PIC qualifications, is also present during flight operations, that person can also be

designated as PIC and will follow the procedures as defined within the SOP to assume control.

14. A briefing will be conducted in regard to the planned operations prior to each flight as detailed within the SOP. It will be mandatory that all personnel who are performing duties within the boundaries of the flight operations safety perimeter be present for the briefing.

15. Petitioner will obtain an Air Traffic Organization (ATO) issued COA prior to conducting any actual flight operations. HSE-UAV will only operate within the guidelines of the blanket 200-foot COA under the FAA's interim policy. For flights above 200 feet AGL, HSE-UAV will operate in a confined geographic area as defined by a separate ATO issued COA.

16. At least three (3) days before scheduled operations, operator shall submit a written Plan of Activities to the local Flight Standards District Office (FSDO) with jurisdiction over the area of proposed operations, such submission of which may be waived with the concurrence of the FSDO. If required by the FSDO to be submitted, the Plan of Activities shall include: dates and times for all flights; operator's and on-scene flight operator's name and phone number; sUAS make, model and serial or N-number; PIC's name and certificate number; statement that the operator has obtained permission from property owners and/or local officials to conduct the operations (such list of those who gave permission to be made available upon request); description of the planned flight activity, including, as applicable, maps or diagrams of the area, city, town, county and/or state over which the operation will be conducted, and the altitudes essential to accomplish the operation; signature of the exemption holder or representative.

17. Petitioner will file a NOTAM for each flight no more than 72 hours but no less than 48 hours prior to each flight with the appropriate FSDO.

18. Any operations that will be conducted within 5 nautical miles (NM) of the geographic center of a non-towered airport will obtain a Letter of Agreement with the appropriate airport management and made available to FAA upon request.

19. Prior to flight operations, Petitioner shall coordinate 1 hour ahead of the proposed flight a communication with the nearest local Air Traffic Control facility

indicating location, altitude and duration of the proposed flight.

20. All required permissions and permits will be obtained from territorial, state, county or city jurisdictions, including local law enforcement, fire, or other appropriate governmental agencies at least 12 hours in advance of any flight operation.
21. The Leptron Avenger shall be marked with an identification (N-Number) in accordance with 14 C.F.R. § 45.23, such markings to be as large as practicable pursuant to 14 C.F.R. § 45.29(f), and identified by a serial number registered in accordance with 14 C.F.R. Part 47.
22. All flights will remain clear and yield the right of way to all other manned operations and activities at all times, including, but not limited to: ultralight vehicles, parachute activities, parasailing activities, hang gliders, etc.
23. Flights will 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.
24. For the proposed flight operation, only one Leptron Avenger shall be airborne at any given time.
25. The Leptron Avenger shall only be operated at or below an airspeed of 24 knots.
26. Prior to performing any flight operations, the PIC and VO shall have successfully completed a qualifying process, as provided in the SOP.
27. Any time the Leptron Avenger is operating, all documents required under 14 C.F.R. § 91.9 and § 91.203 shall be available to the PIC at the GCS. Such documents shall be made available to the Administrator or any law enforcement official upon request.
28. The Leptron Avenger shall not be operated directly over any person, except authorized and consenting personnel required for flight/imaging operations.
29. The Leptron Avenger shall at all times be operated to ensure a safe distance away from all participating and non-participating personnel, at least 500 feet away from persons not involved in the flight operations (non-participating persons) unless:
    - 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.

- 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.

30. Prior to performing any flight operations, a pre-flight checklist will be used by a qualified PIC as provided in the SOP. Documentation of such pre-flight check shall be made in the aircraft records and such records shall be made available to the Administrator upon request.
31. The flight will be terminated at 20% battery power reserve or 12 minutes, whichever occurs first.
32. Prior to each flight, the PIC shall inspect the Leptron Avenger, including any inoperable components, items or equipment, to ensure it is in an airworthy condition for safe flight. If the inspection reveals a condition that affects flight readiness or safe operations, the Leptron Avenger shall not be operated until the necessary maintenance has been performed and it is found to be in a condition for safe flight. Any discrepancies and all maintenance or alterations shall be documented in the aircraft records, such records to be made available to the Administrator upon request.
33. Except as may be designated otherwise for Fail-Safe operations, the Leptron Avenger shall take off and land at a location within the boundaries of the subject property next to the PIC.
34. Upon loss of communication or GPS signal, the Leptron Avenger shall return to a predetermined location within the boundaries of the landowner's property and land or be recovered in accordance with the Operator's Manual.
35. In the event of an emergency or unanticipated obstacle to planned operations, the operation shall be aborted and the Leptron Avenger, if airborne, shall return to a predetermined location.
36. The Leptron Avenger shall be maintained in accordance with the manufacturer's recommended practices and in accordance with the HSE-UAV Maintenance

Manual, including any amendments or updates thereto. All amendments or updates shall be tracked and a record of such amendments or updates shall be maintained and made available to the Administrator upon request.

37. HSE-UAV will follow the manufacturer's aircraft/component, maintenance, overhaul, replacement, inspection and life limit requirements.

38. 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.

39. Any incident, accident or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA shall be reported to the FAA's UAS Integration Office within 24 hours. Accidents shall also be reported to the National Transportation Safety Board (NTSB). Further flight operations shall not be conducted until the incident, accident or transgression is reviewed by the UAS Integration Office and authorization to resume operations is provided.

d. Privacy

Petitioner will comply with all federal, state, and/or local privacy regulations that may apply in the areas in which Petitioner will operate the LEPTRON AVENGER pursuant to this Petition. Further, Petitioner's policy is to avoid operations that might invade personal privacy in accordance with Petitioner's privacy policy available to the administrator upon request.

e. Physical Security

In order to ensure its safe and proper use, Petitioner will be the only operator of the Leptron Avenger and the Leptron Avenger will at all times remain in Petitioner's custody.

5. Lack of Threat to the NAS, Public, or National Security

For the reasons previously addressed, including meeting Section 333(b)(1) criteria, Petitioner's record of safety and the small size of the sUAS involved and the controlled sterile area within which they will operate, Petitioner falls squarely within that zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of sUASs to commence immediately. Petitioner will operate the Leptron Avenger in accordance with the aforementioned flight limitations without creating a hazard to other aircraft or persons or property on the ground. The fact that each PIC will be

required to be screened by the Department of Homeland Security, approval of the petition presents no threat to national security. Further, given its small size and limit load capacity, the Leptron Avenger sUAS is incapable of carrying any substantial external load, including explosive materials or flammable liquids.

For all of these reasons, Petitioner's proposed operations using the Leptron Avenger qualify for expedited approval of the sought exemption pursuant to Section 333 for the specified uses and under the proposed operating requirements and restrictions.

H. Public Interest Benefits

Granting Petitioner's request for exemption would benefit the public and have no adverse effect on safety for the following reasons.

1. Public Interest Generally

The grant of the requested exemption is in the public interest based on the clear direction in Section 333 and 49 U.S.C. § 44701(f), the equivalent and enhanced level of safety of the proposed operations, the significant public benefit, and cost savings to be realized as a result of the use of sUAS for precision aerial imaging and survey services. Moreover, the FAA has granted similar exemptions for sUAS used to conduct high resolution aerial imaging, surveying, flight demonstration, and training operations.[7] The Leptron Avenger is a battery powered sUAS that serves as a safer, more efficient, and economical alternative to larger and heavier manned aircraft carrying flammable liquid fuels, traditionally used for aerial imaging and surveying. This will provide for an added superior level of safety to persons and property in the air and on the ground than that provided by manned aircraft performing the same operations. No pilot or crew need be airborne and granting the exemption would also decrease the number of manned aircraft in the NAS and, as a result, reduce congestion as well as the environmental impact of such operations. Using the Leptron Avenger also provides the benefit of greater operational flexibility and reduced cost when compared to manned aircraft.

a. Increased Aircrew Safety and Reduced Risk to Persons/Property On Ground

Because the Leptron Avenger is unmanned, the proposed operations eliminate the risk to

[7] HSE-UAV requests that the FAA not solicit public comment on its petition because it would not set any new precedent and because the relief requested is identical to exemptions granted previously. 14 C.F.R. § 11.87.

pilot and crew associated with flying such aerial-surveying missions in confined airspace at low altitude. Further, given its small size and weight and low airspeed, using the Leptron Avenger also reduces the risk of damage or injury to persons or property on the ground, and in the air, were there to be an unforeseen mishap.

b. Reduced Environmental Impact

Using the Leptron Avenger sUAS instead of manned aircraft also benefits the public by eliminating or greatly reducing air and noise pollution associated with traditional aerial imaging operations. Because it is battery powered and uses electric motors, the Leptron Avenger sUAS consumes no fuel, generates no air pollution, and creates very little noise. As a result, the public is benefited as a result of reduced environmental impact, reduced operator and other human exposure, and greater fuel conservation, which serves additionally to support our Government's specific efforts to reduce the U.S.'s carbon footprint.[8]

c. Fewer Manned Aircraft in the NAS and Reduced Need for ATC Handling

The HSE-UAV Leptron Avenger also does not require a runway or helipad to takeoff or land and will not be operated within the close proximity of any airports without prior FAA approval. As such, fewer aircraft will need to be handled by air traffic control during ground, takeoff, departure, arrival, and landing phases. Operations pursuant to this Petition will further reduce the number of manned aircraft flying or transiting at or above 500' AGL to and from the areas of imaging operations as well as congestion around airports due to aircraft arrival and departure.

d. Superior Aerial Imagery and Increased Benefit to U.S. Economy

Better aerial footage can also be obtained using the small and nimble Leptron Avenger than can be obtained using manned aircraft or other ground-based methods. Due to its small size and superior flight performance characteristics, the Leptron Avenger allows for images to be taken from certain locations and angles and with better precision than using manned aircraft. As a result, less time is needed in the air to obtain the desired footage, which in addition to providing the benefit of fewer aircraft in the NAS and associated reduced risk to objects and persons and property in the air and on the ground, reduced noise, etc., allows for the production of surveys, which benefits consumers. This additionally ensures that companies such as HSE-UAV and its customers remain competitive and profitable, thereby providing their employees greater job stability, which

[8] Reducing the U.S.'s carbon footprint is a high priority and consistent with the U.S. Environmental Protection Agency's regulatory efforts to phase out the use of fossil fuels.

ultimately contributes further to the U.S. economy through increased consumer spending.

e. Increased Operational Flexibility and Reduced Cost

Using the Leptron Avenger also provides the benefit of greater operational flexibility and reduced cost when compared to manned aircraft. Instead of each time having to hire a manned aircraft at thousands of dollars/hour, subject to the pilot's schedule and availability, Petitioner can operate the Leptron Avenger, which it has purchased and outfitted at lower combined cost, innumerable times and at the convenience of Petitioner's and its customer's schedules.

2. No Adverse Safety Effects

Granting this Petition will also not adversely affect aviation safety or pose any undue risks to the public. The operations pursuant to this Petition will be in accordance with Petitioner's internal SOP, including approved processes and checklists and in compliance with all applicable FAA safety policies and guidance. Accordingly, and as detailed herein, granting the requested exemption would not adversely affect safety. Indeed, as detailed below, operations pursuant to the limitations and guidelines addressed herein and the safety procedures, Petitioner will provide an equivalent level of safety to those regulations from which Petitioner seeks exemption. The FAA has also recently set precedence by granting exemptions with similar aerial imaging and surveying parameters in all material respects, to those presented herein. For these reasons HSE-UAV's operations pursuant to this Petition also qualify for an exemption.

I. Exemptions Sought By Petitioner and Reasons for the Requested Relief

Pursuant to Section 333, Petitioner seeks an exemption from the requirements of 14 C.F.R. §§ 45.27(a), 61.113(a) and (b), 91.7(a), 91.105, 91.119(c), 91.121, 91.151(b), 91.405(a), 91.407(a)(1) and (2), 91.409(a)(1) and (2), 91.417(a) and (b).

1. Section 45.27(a). Location of marks; non fixed-wing aircraft.

Section 45.27, entitled *Location of marks; nonfixed-wing aircraft*, subsection (a) states (emphasis added):

> (a) Rotorcraft. Each operator of a rotorcraft must display on that rotorcraft horizontally *on both surfaces of the cabin, fuselage, boom, or tail* the marks required by § 45.23.

To the extent subsection 45.27(a) may be deemed to apply to the Leptron Avenger sUAS, Petitioner seeks an exemption from the subsection (*i.e.*, that the marks be displayed on both surfaces of the cabin, fuselage, boom, or tail) because the Leptron Avenger sUAS is of

insufficient size to accommodate any such marking. Thus marking the Leptron Avenger sUAS as required by this subsection would not be possible.

An equivalent level of safety can be provided instead by marking the Leptron Avenger sUAS, as may be applicable, with lettering as large as practicable (14 C.F.R. § 45.29(f)) on its largest available surface so as to permit such marking to be displayed to pilot, crew, and others both when the Leptron Avenger sUAS is on the ground and airborne.

2. Section 61.113(a) and (b). Private pilot privileges and limitations: Pilot in command.

Petitioner seeks an exemption from 14 C.F.R. 61.113(a) and (b). Section 61.113, entitled *Private pilot privileges and limitations: Pilot in command*, subsections (a) and (b) state (emphasis added):

> (a) Except as provided in paragraphs (b) through (h) of this section, *no person who holds a private pilot certificate may act as pilot in command of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as pilot in command of an aircraft*.
>
> (b) A private pilot may, for compensation or hire, act as pilot in command 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.

In general, subsections 61.113 (a) and (b) prohibit a private pilot from conducting commercial operations**.** Petitioner seeks exemption from the subsections because the Leptron Avenger will not carry a pilot, passengers or property (other than a camera). As addressed, the Leptron Avenger is a very light, remotely controlled sUAS with no persons or property on board. The area of operations is generally remote or sparsely populated. Each flight is planned and fully coordinated in advance in accordance with those procedures provided in the SOP. Thus the risk associated with the proposed operations is so diminished from that associated with commercial operations contemplated by Part 61, that allowing a PIC having a private pilot certificate, a recreational certificate, or a sport pilot certificate, rather than a commercial certificate, met the minimum flight hour and qualification criteria, and operating according to the limitations and guidelines provided herein, provides a level of safety that exceeds that provided by a pilot having a commercial certificate operating a conventional aircraft as required

under the regulations.

The FAA has already set precedence by previously granted exemptions in circumstances similar, in all material respects, to those presented herein.

3. Section 91.7(a). Civil Aircraft Airworthiness.

Either finding that Petitioner meets the Section 333 criteria or exemption from the airworthiness certification requirement under 14 C.F.R. Part 21 renders subsection 91.7(a) inapplicable.

Section 91.7, entitled *Civil aircraft airworthiness*, subsection (a) states (emphasis added): "No person may operate a civil aircraft unless it is in an *airworthy condition*." There is no FAA standard by which such a determination of airworthiness can be made. Nonetheless, given the limitations and procedures, as contained herein, the Safety Procedures contained within the the SOP, and the Maintenance Manual, for maintaining the aircraft and checking it before each flight to ensure that it is in peak operational condition, an equivalent level of safety will be provided.

4. Section 91.105. Flight crewmembers at stations.

Petitioner seeks an exemption from 14 C.F.R. 91.105. Section 91.105, entitled *Flight crewmembers at stations*, states (emphasis added):

> (a) During takeoff and landing, and while en route, each required flight crewmember shall—
>
> > (1) *Be at the crewmember station* unless the absence is necessary to perform duties in connection with the operation of the aircraft or in connection with physiological needs; and
> >
> > (2) *Keep the safety belt fastened* while at the crewmember station.
>
> (b) Each required flight crewmember of a U.S.-registered civil aircraft shall, during takeoff and landing, *keep his or her shoulder harness fastened while at his or her assigned duty station*. This paragraph does not apply if—
>
> > (1) The seat at the crewmember's station is not equipped with a shoulder harness; or,
> >
> > (2) The crewmember would be unable to perform required duties with the shoulder harness fastened.

In general, Section 91.105 requires pilot and crew to be at their duty stations and

harnessed during flight**.** Petitioner seeks exemption from the Section 91.105 because the Leptron Avenger sUAS is by definition an unmanned aircraft, having neither pilot nor crew so as to be stationed or harnessed as required by the regulation. An equivalent or even higher level of safety can be provided instead by using an unmanned aircraft controlled by a PIC who at all times is located at and controls the Leptron Avenger from the GCS.

5. Section 91.119(c). Minimum safe altitudes.

Petitioner seeks an exemption from 14 C.F.R. 91.119(c). Section 91.119, entitled *Minimum safe altitudes: General*, subsection (d) states (emphasis added):

> Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:
>
> (c) *Over other than congested areas.* An altitude of *500 feet above the surface*, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

Section 91.119(c) establishes safe altitudes for operation of civil aircraft over other than congested areas. Petitioner seeks exemption from subsection 91.119(c) because, pursuant to this Petition, the Leptron Avenger sUAS will at times be operated at or below 200 or 400 feet AGL in accordance with the COA requirements.

An equivalent or even higher level of safety can be provided instead by, as provided herein, operating so as to de-conflict with manned vehicles operating above 500 feet AGL, within the VLOS of the PIC with the assistance of a VO so as to ensure the safety of and de-confliction with any persons or property in the air and on the ground, including participating and non-participating personnel, 100 feet and 500 feet, respectively, away from who the UA would generally be restricted. Further the Leptron Avenger sUAS flight operations will be monitored at all times by both the PIC and VO and will be in compliance with local public safety requirements, so as to prevent access to the restricted areas of operation.

The FAA has set precedence by previously granted exemptions in circumstances similar, in all material respects, to those presented herein.

6. Section 91.121. Altimeter settings.

Petitioner seeks an exemption from 14 C.F.R. 91.121. Section 91.121, entitled *Altimeter settings*, requires each person operating an aircraft to maintain cruising altitude by reference to

an altimeter that is set "…to the elevation of the departure airport or an appropriate altimeter setting available before departure." Petitioner seeks exemption from Section 91.121 because the Leptron Avenger sUAS does not use or have on board a typical barometric altimeter as contemplated by the regulation.

Note: An equivalent level of safety will be provided instead, by operating the sUAS at or below 400 feet AGL, within the VLOS of the PIC (with the assistance of a VO), with altitude information downlinked from the Leptron Avenger to the PIC to maintain altitude and ensure safety. Prior to each flight, a zero altitude/AGL will be established at the launch site, as confirmed for accuracy by the PIC.

7. Section 91.151(b). Fuel requirements for flight in VFR conditions.

Petitioner seeks an exemption from 14 C.F.R. 91.151(b). Section 91.151(b), entitled *Fuel requirements for flight in VFR conditions*, states (emphasis added):

> (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*.

The Leptron Avenger is an unmanned aircraft, and thus would not begin a flight with a person in it as the regulation contemplates. To the extent the regulation applies to the Leptron Avenger, the LEPTRON AVENGER has a maximum flight duration of 20-60 minutes, depending upon atmospheric conditions and type of camera or sensor.

An equivalent level of safety can be achieved by terminating the flight at 20% battery power reserve or 12 minutes whichever occurs first. Given that the Leptron Avenger will be operated within the VLOS of the PIC, within the confines of the particular landowner's property with prior written consent of the landowner and participating and non-participating personnel, this restriction would provide more than enough battery reserve to accommodate a safe return to the landing zone from anywhere in the operating area with no adverse effect on the safety of persons and property in the air or on the ground.

The FAA has set precedence by previously granted exemptions in circumstances similar, in all material respects, to those presented herein.

8. Sections 91.405(a), 91.407(a)(1), 91.409(a)(2), 91.417(a) and (b). Maintenance inspections and recording.

Section 91.405(a), entitled *Maintenance required*, states:

> 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;

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

> (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;

Section 91.409 (a)(2), entitled *Inspections*, states:

> (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.
>
> No inspection performed under paragraph (b) of this section may be substituted for any inspection required by this paragraph unless it is performed by a person authorized to perform annual inspections and is entered as an "annual" inspection in the required maintenance records.

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

> (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.

In general, these regulations require that an airworthy certificated aircraft be inspected as prescribed in 14 C.F.R. Part 91, Subpart E (Maintenance, Preventive Maintenance, and Alterations), any discrepancies be repaired and the aircraft be approved for return to service as prescribed in Part 43 (Maintenance, Preventive Maintenance, Rebuilding, and Alterations) and that any work on the aircraft be recorded and such records maintained.

Petitioner seeks an exemption because, as addressed, the Leptron Avenger sUAS will operate pursuant to this Petition without airworthiness certification. An equivalent level of safety can be provided instead by requiring, as provided herein, that inspections and maintenance be accomplished according to the inspection, maintenance, and preflight sections of the Maintenance Manual and SOP, and IAW the manufacturer's guidance in the Leptron Avenger Operator's Manual. Among other things, the Leptron Avenger will be inspected prior to each flight to confirm that it is in good working order. Any maintenance or repairs will be perform and logged, and, upon any work being performed on the Leptron Avenger, it will be checked and approved for flight by personnel before being returned to service.

The FAA has set precedence by previously granted exemptions in circumstances similar, in all material respects, to those presented herein.

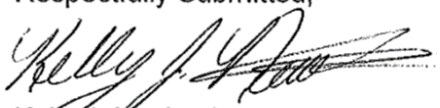
J. Conclusion

As set forth in the document above, the following summary is provided for publication in the Federal Register. Petitioner seeks an exemption pursuant to Section 333 of the FAA Modernization and Reform Act of 2012, 49 U.S.C. § 44701(f), and 14 C.F.R. Part 11 to permit safe operation of the Leptron Avenger sUAS commercially, for controlled, low-risk, aerial mapping, surveying, product demonstration flights for potential customers, product training for potential customers, research and development, and pipeline inspection. By granting this Petition, the FAA Administrator will be fulfilling the Congressional mandate of Section 333 of the FAA Modernization and Reform Act of 2012 to expedite approval of operations of certain sUAS in the NAS, while also advancing the interests of the public.

WHEREFORE, in accordance with the Title 49 of the United States Code, the Code of Federal Regulations, and the FAA Modernization and Reform Act of 2012, Section 333, Petitioner respectfully requests that the Administrator grant this Petition for an exemption from

the requirements of 14 C.F.R. §§ 45.27(a), 61.113(a) and (b), 91.7(a), 91.105, 91.119(c), 91.121, 91.151(b), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (b), and 91.417(a) and (b).

Respectfully Submitted,



Kelly J. Neubecker
CEO
UASolutions Group, Inc.

cc: David Sanders, Homeland Surveillance & Electronics, LLC