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

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

August 28, 2015

Exemption No. 12659
Regulatory Docket No. FAA–2015–1780

Mr. Stephen Burtt
Aerial Technology International, LLC
9053 SE Jannsen Road
Clackamas, OR 97015

Dear Mr. Burtt:

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

By letter dated May 4, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Aerial Technology International, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial film and videography, photography, agricultural mapping, surveying, and infrastructure inspections.

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

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

Airworthiness Certification

The UAS proposed by the petitioner are the ATI AgBot, Thor X4, and the AgGasser.

In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation

has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

You have requested to use a UAS for aerial data collection[1]. The FAA has issued grants of exemption in circumstances similar in all material respects to those presented in your petition. In Grants of Exemption Nos. 11062 to Astraeus Aerial (*see* Docket No. FAA−2014−0352), 11109 to Clayco, Inc. (*see* Docket No. FAA−2014−0507), 11112 to VDOS Global, LLC (*see* Docket No. FAA−2014−0382), and 11213 to Aeryon Labs, Inc. (*see* Docket No. FAA−2014−0642), the FAA found that the enhanced safety achieved using an unmanned aircraft (UA) with the specifications described by the petitioner and carrying no passengers or crew, rather than a manned aircraft of significantly greater proportions, carrying crew in addition to flammable fuel, gives the FAA good cause to find that the UAS operation enabled by this exemption is in the public interest.

Having reviewed your reasons for requesting an exemption, I find that—

- They are similar in all material respects to relief previously requested in Grant of Exemption Nos. 11062, 11109, 11112, and 11213;
- The reasons stated by the FAA for granting Exemption Nos. 11062, 11109, 11112, and 11213 also apply to the situation you present; and
- A grant of exemption is in the public interest.

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, Aerial Technology International, LLC is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

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

Conditions and Limitations

In this grant of exemption, Aerial Technology International, LLC is hereafter referred to as the operator.

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

1. Operations authorized by this grant of exemption are limited to the ATI AgBot, Thor X4, and AgGasser 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

Stephen Burtt
ATI CEO

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9053 SE Jannsen Rd.
Clackamas, Oregon 97015
Tel (971) 303-9981

The Honorable Anthony R. Foxx
Office of the Secretary
US Department of Transportation
1200 New Jersey Ave., SE
Washington, DC 20590

The Honorable Michael P. Huerta
Office of the Administrator
Federal Aviation Administration
800 Independence Avenue SW
Washington, DC 20591

May 4, 2015

RE: Aerial Technology International LLC sUAS Airworthiness Exemption Petition for FMRA 2012 Sec 333 Exemption

Gentlemen:

Aerial Technology International, LLC ('ATI') hereby petitions the FAA for regulatory relief pursuant to Section 333 of P.L. 112–95 333 and 14 C.F.R. Sec. 11.81 to conduct commercial flights with ATI sUAS and to pursue research and development of ATI sUAS. Attached, therefore, is a request for exemption from airworthiness and specific Title 14 C.F.R. provisions for the types of sUAS and sUAS operations described in this Section 333 exemption petition. Specifically, we request the airworthiness exemptions for ATI sUAS for the purposes of commercial film and video, photography, agricultural mapping, and surveying, and infrastructure inspections. The FAA has issued grants of exemption in circumstances similar in all material respects to those presented in this petition, specifically Exemptions No. 11136, 11193, 11170, 11194, 11192, 11177, and 11166 (precision agriculture); No. 11066, 11150, 11062, 11080, 11160, 11067, 11178 (film&videography); No. 11171, 11185, 11184, 11156, 11110, 11112 (mapping and inspections). We therefore request that our petition be granted without delay.

Background

This petition seeks authorization to operate the ATI sUAS described in this petition within restricted-access areas. These areas of operations include rural, agricultural areas similar to areas described in Exemption No. 11136, 11193, 11170, 11194, 11192, 11177, and 11166. Restricted access areas would also include areas restricted for film, photography, infrastructure inspection, and real estate videography purposes. Our operations will generally fall within conditions of the blanket COA provided with the 333 grant. For any other operation, a civil COA will be sought.

Generally, ATI sUAS operations will be below an altitude of 200 ft. AGL, within specific access-restricted areas, either within Class G airspace or with the permission of the ATC, using sUAVs operated by ATI-qualified sUAS pilots, and within the visual line of sight of the operator and

observer. These operational limitations are in accordance with both recently granted petitions as well as the Small UAS NPRM release February 15th, 2015. The UAVs described in this proposal are of small size and weight (less than 55 lb.), only capable of relatively slow speeds (top speed of a UAV to be deployed under this petition is less than 100 mph.) and, as demonstrated in this petition and accompanying General Operating Manual (provided confidentially under separate cover), do not pose a threat to the safety of the NAS, persons on the ground, or national security.

This petition seeks authorization to conduct commercial services, commercial training, and R&D flights according to the terms of this petition and the ATI General Operations Manual ('ATI Manual') which is composed of (1) an operations manual, (2) flight manuals for each of the ATI models; (3) an Operator Training Manual, and (4) a Maintenance and Inspection Manual. Please note that the ATI Manual (including all of the above listed components) are clearly marked "Confidential" on each page and contain confidential commercial and proprietary information that ATI has not and will not share with others who are not subject to a "Nondisclosure Agreement" (NDA). Therefore, the ATI Manual (including all components) are not available to the public and contain operating conditions, procedures and other information that are protected from public release or disclosure under the Freedom of Information Act 5 USC Sec. 552 et seq.

Why we require an exemption

ATI requires exemption from 14 CFR airworthiness and other requirements for both commericial operations and development of new UAS for the several types of operations including; R&D, training, precision agriculture services, infrastructure inspection, and various filming and surveying services.

Commercial Operations

All commerical SUAS operations require an exemption under current FAA regulations. ATI therefore requests an airworthiness exemption for the specific types of sUAS described in this petition in order to carry sensor packages, e.g. film and video equipment under the conditions and operating limitations outlined below and described in the ATI Manual. ATI intends to operate these sUAS to provide services to farms in the United States in order to increase crop yields, and reduce water use, and enhance agricultural efficiency. It is imperative for the economic well-being of US farmers that the low-risk application of efficiency-enhancing and cost-reducing UAS technology in US agriculture be permitted, especially during drought conditions such as are being faced in many areas today. In addition, ATI intends to provide infrastructure inspection services including; bridge, powerline, power pole, and wind turbine inspection, as well as commercial film and real estate videography services.

Precision Agriculture

ATI unmanned systems simplify and increase the accuracy of data collection in precision agriculture, infrastructure inspection, and aerial filming. ATI Ag Drones provide useful data that enable farmers, viners and ranchers the ability to make cost-effective, proactive, decisions based on information provided through video, infrared, multispectral and hypersprectral imaging. The data collected from our Ag Drones can be used to identify insect problems and water issues, assess crop yields, determine correct harvest times, track cattle, inspect fence lines, etc. that aid farmers to protect and manage their investments. ATI also intends to use our Ag Drones to provide turn key services to improve agriculture nationwide.

Training and Education

An integral part of the intended ATI service offering is ensuring that purchasers of UAVs built by ATI are fully qualified on the aircraft. ATI will provide mandatory operational training on all professional aircraft sold to customers. This improves safety and security as well as reducing the likelihood of unsatisfied customers. However, in order to perform this commercial flight training we require an exemption.

Research and Development

ATI also designs and manufactures UAS and therefore needs to be able to rapidly iterate upon and test our innovative designs. Unlike manned aircraft testing, which generally only requires airspace away from air traffic above low-risk areas and which is mainly indifferent to the underlying terrain; testing our sUAS requires access to real areas of operation, i.e. farms, power lines, etc. in order to evaluate the low-altitude, context-dependent performance of both our aircraft and our sensors. For example, multiple, real-world farms growing multiple varieties of crops are a requirement for the functional testing of our aircraft.

Unfortunately, FAA Order 8130.34C for a Special Airworthiness Certificate: Experimental Category does not authorize the necessary variations in aircraft characteristics, systems, or test ranges to meaningfully test these sUAS and to iterate efficiently.

Therefore, to gain the meaningful data about sUAS features necessary for developing a program for safe and efficient sUAS operations, an exemption is required that authorizes R & D: 1) across a range of ATI models and prototypes, 2) in a variety of locations (subject to the restrictions outlined in this petition), and 3) for iterating on the systems, sensors, and airframes on an ongoing basis. Without this exemption the regulatory requirements for a Special Airworthiness Certificate, Experimental Category (SAC-EC) are overly burdensome because they forbid the necessary R & D; i.e. rapid iterations on early prototypes. Finally, as the FAA is well aware, the SAC-EC does not authorize commercial operations of the type described above such are required for ATI research and development.

The types of sUAS for which ATI requests exemptions

ATI designs and manufacturers sUAS that are low kinetic energy; these sUAS are approximately equivalent in size and performance to the US Air Force "Micro UAS" class of UAS. Specifically, these sUAS are small (< 2 meter in largest dimension), light-weight (~ 55 lb. or less), slow-moving (less than 100 mph) and operate close to the ground (< 500 ft. AGL).

We believe that ATI sUAS meet the standard provided by Section 333 of the FMRA for a UAS to operate safely within the National Airspace prior to the completion of FMRA's required rule-making. Section 333 describes seven minimum criteria to determine whether an sUAS may operate safely in the NAS without creating a hazard or posing a threat to national security. These criteria comprise size, weight, speed, operational capability, operation in close proximity to airports, operation in close proximity to people, and operation within visual line of sight. ATI's sUAS are of a type and scale that meet these criteria and are equivalent to those for which FAA has recently granted Sec 333 exemptions (see Ex. No. 11136, 11193, 11170, 11194, 11192, 11177, 11166) and, similarly, are not anticipated to create a hazard to users of the National Airspace System ("NAS"), persons on the ground, or pose a threat to national security. Basic characteristics of the ATI UAVs are summarized in the table ATI SUAS (Table 1).

Table 1: ATI SUAS

SUAS	type	Max Weight	Max Speed
AgBot	small quadcopter	12 lb	15 meters/sec
Thor X4	large octocopter	50 lb	25 meters/sec
AgGasser	large single rotor	50 lb	30 meters/sec

Information Supporting this Petition as Specified in 14 C.F.R. Sec. 11.81

This section responds to the specific requirements of 14 CFR Sec 11.81. The attached Exhibit A presents an analysis of the CFRs for which exemptions are requested.

(a) Mailing address and other contact information such as a fax number, telephone number, or email address copy.

Aerial Technology International, LLC
ATTN: Stephen Burtt
9053 SE Jannsen Rd.
Clackamas, Oregon 97015
Email: stephen@aerialtechnology.com

(b) The specific section or sections of 14 C.F.R. from which ATI seeks an exemption

- Part 61 Certification: Pilots, Flight Instructors, and Ground Instructors
- §61.113(a) Private pilot privileges and limitations
- Part 67 Medical Standards and Certification
- §91.7(a) Civil aircraft airworthiness
- §91.119(c) Minimum safe altitudes
- §91.121 Altimeter settings
- §91.151 Fuel requirements for flights in VFR conditions
- §91.405 Maintenance required
- §91.407 Operation after maintenance
- §91.409 Inspections
- §91.417 Maintenance records

(c) The extent of relief ATI seeks, and the reason ATI seeks the relief

An exemption is required because current FAA regulations do not allow commercial use of sUAS in the NAS, or for appropriate research and development of sUAS. ATI requests an airworthiness exemption for the specific types of sUAS described in this petition to carry sensor packages under the conditions and operating limitations outlined below and described in the ATI Manual. In addition,

ATI is developing sUAS and sUAS software, so that sUAVs may fly safely and predictably in the NAS. In order to develop and test these sUAS under the variety of operational conditions that a sUAS will face in the NAS, it is necessary to test variations on aircraft characteristics and operating systems in different, and real-world test environments. FAA regulations in FAA Order 8130.34C for a Special Airworthiness Certificate: Experimental Category do not authorize the necessary rapid modifications of aircraft characteristics and associated systems to sufficiently and efficiently test these sUAS.

Therefore, to gain meaningful data about the necessary features for safe and efficient sUAS operations, an exemption is necessary : 1) to operate a range of sUAS models and prototypes, 2) in a variety of locations (subject to the restrictions outlined in this petition), 3) to be permitted to adjust the systems and airframes tested on an ongoing basis, and 4) for both research and commercial use. Finally, as the FAA is well aware, the exemption is necessary because the SAC-EC does not authorize commercial operations of the type sought here, which is required for ATI to develop accurate data about the types of sUAS that are best suited for safe and effective operations. The attached document "Information Supporting Petition" details the extent of relief and reason for each FAR.

(d) The reasons why granting ATI's request would be in the public interest; that is, how it would benefit the public as a whole

The proposal is designed to establish a reasonable methodology to test specific types and platforms of sUAS, in a variety of environments, and to enable the safe and efficient deployment of commercial sUAS for agricultural purposes. The outputs of safe, reliable, and regulatory compliant operations of sUAS provide economic benefits historically unparalleled since the invention of flight, benefitting stakeholders at every level, both public and private. Lawful, safe aerial robotics operations will create new high-tech employment that will stimulate city and state governments; improve agriculture, create new small and large businesses; infuse new interest in STEM for children; and increase the safety of citizens through enhanced first-responder capabilities.

Specifically, sUAS-supported precision agriculture has the promise of dramatically increasing crop yields by identifying which crops are ready to be harvested, reducing farming uncertainty by providing better data to inform yield estimates, and reducing inefficiencies in inputs by identifying precisely where and when crops need to be treated or irrigated. Crops can even be protected from depredation by birds by harmlessly shepherding the birds away from the fields. This is a much more sustainable method of mitigating the impact of wildlife to crops than other methods. And these are only a few of the many benefits that sUAS enabled precision agriculture will create and are creating now.

In addition, sUAS-enabled infrastructure inspection directly reduces the risks incurred with traditional means of inspections - such suspending an inspector on a rope or raising them on a crane- as well as decrease the costs associated with inspections. The decreased cost will not only provide direct economic benefits to our clients in terms of cost savings, but the reduced cost will encourage more frequent inspections.

Finally, aerial filming is widely performed by manned helicopters flying in close proximity to buildings, vehicles, film crews, and actors. In case of accident, the hazards posed by a helicopter in such an environment are considerable. The FAA has found that the enhanced safety achieved using an unmanned aircraft with the specifications described by the petitioner and carrying no passengers or

crew, rather than a manned aircraft of significantly greater proportions and weight, 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.

Grant of this petition would enable the research and operational development of sUAS to enable the safe and efficient acceleration of these significant public benefits to American farmers, consumers, and to the United States public as a whole, and therefore is in the public interest.

(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 ATI seeks the exemption

ATI operations will provide a level of safety that is equivalent to current aviation standards. ATI's safety procedures, risk assessments, and flight operations standards are described in detail in the accompanying ATI Operations Manual. In brief, the following procedures that apply during operations conducted under this exemption request, establish an equivalent level of safety (ELOS) as follows:

1. The ATI sUAS are less than 55 pounds with maximum speeds well under 100 mph.
2. All ATI sUAS will be U.S. registered and display marks either in accordance with 14 C.F.R. Part 45, Subpart C or approved alternative markings.
3. ATI sUAS operations under this exemption will be generally conducted within the visual line of sight of the pilot operator, at less than 400 feet AGL, and within Class G airspace. In addition, operations in controlled B,C, or D airspace will be conducted in coordination with ATC with prior permission.
4. Consistent with the recently issued Section 333 Exemption No. 11062 (Astraeus Aerial) and others, ATI operations will be conducted in defined regions and over property authorized for this use by the landowner. All operations will remain within the geographic boundaries of the operating area. It is anticipated that most ATI operations may be conducted within the limitations of the blanket COA authorization provided with 333 grants as of 3–23–2015.
5. sUAS operations under this exemption will be conducted under the supervision of a designated pilot in command (PIC) who has final responsibility for the operation and in accordance with 14 C.F.R. 91.3. See the Pilot Requirements section below. All sUAS operators and observers must have completed training on the normal, abnormal, and emergency procedures in the ATI Manual, demonstrated proficiency with the sUAS being operated, and passed the Private Pilot FAA Ground School knowledge test. All ATI pilots will be required to pass a background check as provided by the TSA PreCheck program.
6. Operators and engineers will maintain the sUAS system in a condition for safe operation according to the ATI Manual and associated manufacturer's maintenance manuals, including pre-flight and post-flight inspections.
7. The PIC and observers will maintain situational awareness and perceive, process, and perform risk management prior to and during each operation as described in the ATI Manual. The PIC will terminate the operation in accordance with the ATI Manual if hazards that cannot be acceptably mitigated are observed.

8. sUAS will safely stop operating and either return home or auto-land at a location along the flight path if the control link is lost.

9. For each sUAS, the PIC will have the ability to force a controlled landing at any time.

In addition to the above, ATI has implemented a Safety Management System. The ATI Safety Manager is responsible for conducting safety audits, investigations, and inspections and is authorized to stop or prohibit any activity or operations which is considered unsafe. Full details are available in the ATI Manual.

ATI seeks this exemption to conduct commercial operations and supporting R&D of sUAS within restricted-access areas in the NAS. Without this exemption, sUAS innovation will be suppressed, the public economic benefits derived from increased sUAS development will be denied, and the Congressional directive to accelerate the integration of UAS into the NAS will be impeded. ATI sUAS physical and operational characteristics are compliant with those described in the FMRA and FAA's guidance for exemptions under Section 333. ATI respectfully requests that the FAA grant us a petition for exemption from airworthiness.

Please do not hesitate to contact Andrew McCollough, the Regulatory Services POC, via email at exemption@skyward.io if you have any questions or concerns.

Very Respectfully Yours,

Stephen Burtt
ATI CEO

ATI sUAS Airworthiness Exemption Petition

Information Supporting Petition v1.0

May 4, 2015

Table of Contents

Section 1

Specific Exemption Requests

ATI's reasons and explanation for requesting each exemption are presented below. In addition, we describe how we will maintain an equivalent level of safety to existing regulations for manual operation of manned aircraft, insofar as existing regulations apply to sUAS or sUAS operations.

1.1 PART 61, CERTIFICATION: PILOTS, FLIGHT INSTRUCTORS, AND GROUND INSTRUCTORS

1.1.1 EXTENT OF RELIEF

Part 61, all sections.

1.1.2 REASON FOR RELIEF

Because the UAS will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations by requiring the PIC operating the aircraft to have at least a sport pilot's license rather than a commercial pilot's license to operate these sUAS.

1.1.3 EQUIVALENT LEVEL OF SAFETY

Unlike a conventional aircraft that carries the pilot and passengers, the sUAS is remotely controlled with no living thing on board. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance as set forth in the GOM. The level of safety provided by the requirements included in the GOM exceeds that provided by a single individual holding a commercial pilot's certificate operating a conventional aircraft. The risks associated with the operation of the sUAS are so diminished from the level of risk associated with commercial operations contemplated by Part 61 when drafted, that allowing operations of the sUAS as requested with a sport pilot certificate as the PIC exceeds the present level of safety achieved by 14 C.F.R. §61.113 (a) & (b).

1.2 §61.113 PRIVATE PILOT PRIVILEGES AND LIMITATIONS: PILOT IN COMMAND.

1.2.1 EXTENT OF RELIEF

Relief from requirement to possess a private or commercial pilot's license for aerial work such as aerial survey and mapping.

1.2.2 REASON FOR RELIEF

§61.113 (a) stipulates that a holder of a private pilot certificate may not act as a pilot in command of an aircraft for compensation or hire; (b) states that a private pilot may act as PIC if the flight is incidental to business and does not carry passengers or property. Furthermore, N–8900.227 "Unmanned Aircraft Systems (UAS) Operational Approval" paragraph 16(c)(2)(c) "Operations without a pilot certificate" states that a operations which conform to said paragraph may be performed by a PIC that does not possess a private pilots license but that has completed FAA private pilot ground instruction and passed the FAA Private Pilot written test. In addition, there is no means currently of obtaining a commercial rating for UAS. Thus, we require relief in order to perform aerial work.

1.2.3 PUBLIC BENEFIT

As described above, the public benefit includes exponential economic growth, enhanced safety, and improved precision agriculture capabilities.

1.2.4 EQUIVALENT LEVEL OF SAFETY

Our operations fullfill all the requirements in N–8900.227 16(c)(2)(c) for operations without a private pilots license.

1.3 §91.7 CIVIL AIRCRAFT AIRWORTHINESS.

1.3.1 EXTENT OF RELIEF

91.7, all provisions.

1.3.2 REASON FOR RELIEF

Should the exemption be granted allowing commercial operation of the sUAS without an airworthiness certificate, no standard will exist for airworthiness of the sUAS.

1.3.3 EQUIVALENT LEVEL OF SAFETY

Given the size and weight of these aircraft and the requirements contained in the GOM, an equivalent level of safety will be achieved by insuring compliance with the sUAS user manuals prior to each flight.

1.4 §91.119, MINIMUM SAFE ALTITUDES: GENERAL.

1.4.1 EXTENT OF RELIEF

Section 91.119 establishes safe altitudes for operation of civil aircraft. 91.119(c) limits aircraft flying over areas other than congested areas to an altitude of 500 feet above the surface, except over open water or sparsely populated areas, and the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

1.4.2 REASON FOR RELIEF

To provide for these operations, the sUAS are normally operated at or below 400 feet AGL. In addition, due to the nature of the proposed operations, the PIC and the observer may at times be less than 500 feet away from structures during the operation.

1.4.3 EQUIVALENT LEVEL OF SAFETY

The equivalent level of safety will be achieved given the size, weight, and speed of the UAS as well as the location where it is operated. No flight will be taken without the required permission of the property owner or local officials. Because of the advance notice to the property owner and participants in the aerial activity, all affected individuals will be aware of the planned flight operations. Compared to flight operations with aircraft or rotorcraft weighing far more than the maximum 55lbs. described above and the lack of flammable fuel, any risk associated with these operations is far less than those presently conducted with conventional aircraft operating at or below 500 AGL in other industries. In addition, the low-altitude operations of the sUAS will ensure separation between these sUAS operations and the operations of conventional aircraft that must comply with Section 91.119.

1.5 §91.121 ALTIMETER SETTINGS

1.5.1 EXTENT OF RELIEF

§91.121

1.5.2 REASON FOR RELIEF

As the sUAS may not have a barometric altimeter, but instead a GPS altitude read out, an exemption may be needed.

1.5.3 EQUIVALENT LEVEL OF SAFETY

An equivalent level of safety will be achieved by the operator, pursuant to the Manual and Safety Check list, confirming the altitude of the launch site shown on the GPS altitude indicator before flight.

1.6 §91.151, FUEL REQUIREMENTS FOR FLIGHT IN VFR CONDITIONS.

1.6.1 EXTENT OF RELIEF

§91.151, all provisions.

1.6.2 REASON FOR RELIEF

The provision requires fuel sufficient for one half hour flight beyond the destination. These sUAS, including today's longest endurance platforms, are unable to meet this requirement because of limited max flight times.

1.6.3 EQUIVALENT LEVEL OF SAFETY

An equivalent level of safety can be achieved by limiting flights for the sUAS according to the safety limitations described in the GOM. This restriction would be more than adequate to return the sUAS to its planned landing zone from anywhere in its limited operating area.

1.7 §91.405, §91.407 §91.409 §91.417; INSPECTION AND MAINTENANCE PROGRAMS

1.7.1 EXTENT OF RELIEF

§§ 91.405, Maintenance required; 91.407, Operation after maintenance, preventive maintenance, rebuilding, or alteration; 91.409, Inspections; and 91.417, Maintenance records.

1.7.2 REASON FOR RELIEF

The part 91 provisions are not applicable to a sUAS of the described weight class. Furthermore, FAA certified mechanics for sUAS do not at this present time exist, so full compliance is not possible. The sUAS flown are modular and as such entire components including engines and propellers are minor replacements rather than major repairs. Finally, continuous minor alterations and payload reconfigurations of sUAS are designed and required for the operation of sUAS and do not negatively impact airworthiness.

1.7.3 EQUIVALENT LEVEL OF SAFETY

Inspection and maintenance manuals are used to maintain the sUAS in airworthy condition. Each sUAS is maintained according to the manufacturer standard or higher by technicians proficient in the building, repair, and maintenance of the sUAS. Inspection and Maintenance manuals utilized contain all aircraft-relevant items as described in (43 Appendix D (Scope and Detail of Items). Maintenance records are maintained in SkyWard Operations Database Appendix B (Recording of Major Repairs and Major Alterations) and are therefore immediately auditable by regulators on demand. Finally, SkyWard manuals will be submitted to the local FSDO ASI or other appropriate FAA division directly.