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

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

May 4, 2015

Exemption No. 11453
Regulatory Docket No. FAA–2015–0231

Mr. James T. Adams
Vice President
USAerobotix, LLC
P.O. Box 124
Gettysburg, OH 45328

Dear Mr. Adams:

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 January 28, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of USAerobotix, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography and other sensors to inspect utility infrastructure and equipment, wind turbine blades and other structural aspects of wind farms, solar power panels, and vegetation and line clearance for tree trimming.

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. However, four comments were filed in the docket in support of the petition.

Airworthiness Certification

The UAS proposed by the petitioner is a SelectTech Geopatial EH-4.

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

The Basis for Our Decision

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

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

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

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, USAerobotix, 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.

Conditions and Limitations

In this grant of exemption, USAerobotix, 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 SelectTech Geopatial EH-4 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 May 31, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Applicant Name and Contact Information:
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January 28, 2015

Exemption Request Pursuant to Section 333 of FAA Reform Act Part 11 of FAA Regulations 14 C.F.R. 21; 45.23(b); 61.113(a) & (b); 91.119(c); 91.121; 91.151(a); 91.405(a); 91.407(a)(1); 91.409(a)(1) & (2); 91.417(a) & (b)

Dear Administrators,

Pursuant to Section 333 of the Federal Aviation Administration Reform Act of 2012 and 14 Code of Federal Regulations Part 11 ("Regulations"), USAerobotix LLC, ("USAerobotix") operator of SelectTech Geospacial's EH-4 Unmanned Aerial System ("UAS") will perform operations involving the use of aerial photography and other sensors equipped to the UAS to inspect—

1) utility infrastructure and equipment including substations, transmission towers, distribution towers, pipelines, flare stacks, and other industrial equipment;
2) wind turbine blades and other structural aspects of wind farms;
3) solar power panels;
4) vegetation and line clearance for tree trimming near the infrastructure stated above;

herein referred to collectively as "the Operation", **applies for exemption from the following Regulations**:

1) 14 C.F.R. 21;
2) 14 C.F.R. 45.23(b);
3) 14 C.F.R. 61.113(a) & (b);
4) 14 C.F.R. 91.119(c);
5) 14 C.F.R. 91.121;
6) 14 C.F.R. 91.151(a);
7) 14 C.F.R. 91.405(a);
8) 14 C.F.R. 91.407(a)(1) & (2);
9) 14 C.F.R. 91.409(a)(1) & (2);
10) 14 C.F.R. 91.417(a) & (b).

An exemption from the listed Regulations is requested to allow commercial activity of the Operation utilizing the UAS to be performed by USAerobotix. The Operation will only be conducted by USAerobotix with the use of the UAS as outlined in this request, with procedures documented in the attached proprietary documentation ("Attachments") or what may be established by the FAA if an exemption were granted under Section 333 or Section 49 of the United States Code § 44701(f).

The conditions listed in this application, set forth by USAerobotix, are drafted following exemptions and guidelines drafted by the FAA to maintain the highest level of safety, either maintaining or exceeding current safety standards, practices, and regulations. USAerobotix applies for an exemption to provide a safer method of the Operation compared to manned aircraft and manned ground inspections. The Operation will be conducted in a limited space with limited, approved access.

Section 333 of the FAA Reform Act of 2012 grants authority to the FAA to issue exemptions based on the safety of the Operation and the UAS with established requirements set out by both the application and exemption granted for the Operation.

The Attachments to this request are considered proprietary. We ask that you request these documents separately from the public accessible website. Each attachment is numbered and will each hereinafter referred to as the following:

1) Attachment 1 ("The Manual");
2) Attachment 2 ("Maintenance Log");
3) Attachment 3 ("Flight Log");
4) Attachment 4 ("Knowledge Exam");
5) Attachment 5 ("Certificate of Completion").

USAerobotix is a fee-for-service company who will perform each task within the Operation for the power industry. The UAS is purchased by USAerobotix from SelectTech Geospacial ("the Manufacturer") who holds a Certificate of Authorization for the development, testing, and training of the UAS, model EH-4. The UAS is a Vertical Take Off and Landing ("VTOL") rotorcraft with four rotors and weighs under 5 lbs., including the payload. The airframe is constructed from G-10 fiberglass reinforced polyester resin, which can withstand rough landings and challenging environments. Additionally, the construction of the airframe and the components and hardware greatly reduce the conductivity of the UAS. The speed capability of the UAS is 50 knots, however the Operation is intended to travel no more than 35 knots, both vertically and horizontally. The structures USAerobotix intend to include in the Operation stand below 400 feet AGL. However, some structures do exceed this height, which are already considered an obstacle to other aircraft. The Manufacturer, USAerobotix, and detailed in the Manual, the Operation will include a Pilot-in-Command ("PIC") and Visual Observer ("VO"), operate lower than 400 feet AGL (unless approval is granted on a case-by-case basis for special operations involving taller structures), stay well within Visual Line of Sight ("VLOS"), and cause no hazard to any users of the national airspace or the public. The Manual details the safety standards of USAerobotix, the safety redundancies of the UAS, and mitigate how USAerobotix will help in establishing requirements for safe operation in the national airspace system ("NAS").

As granted to the FAA by Section 333 of the Reform Act, USAerobotix asks for an exemption to carry out the Operation commercially using the UAS. This application includes arguments and Attachments that will explain how the Operation will uphold or exceed current levels of safety, if there is a public interest in the Operation, and steps taken to ensure national security remains a priority.

Reviewing Exemption 11062 granted by the FAA to the movie industry, USAerobotix will operate with similar limitations and conditions, which will be referred to later in the application. This will ensure a high level of safety already approved by the FAA and hold USAerobotix accountable for how the

Operation is conducted. **The List of Limitations and Conditions** are already addressed throughout the Manual, and are as follows:

1. The UAS described in this application, including all payload, must weigh less than 20 lbs.
2. The UAS will not exceed 35 knots during the Operation, and no more than 50 knots in transitional airspace.
3. The Operation will be conducted less than 400 feet AGL and reported to Air Traffic Control ("ATC"). If a structure exceeds this height restriction, the PIC must obtain approval from the FAA to perform the Operation in a limited capacity.
4. The Operation will be conducted in VLOS for the PIC at all times, regardless of the VO orientation. The PIC and VO must only use natural eyesight, aided only by corrective lenses or glasses, to meet this requirement and hold an FAA medical certificate.
5. The VO and PIC must maintain verbal communication at all times.
6. The Manual attached to this application binds USAerobotix to the limitations outlined within, as approved by the FAA. If the FAA imposes other limitations or conditions, the Manual will be revised to include such revisions. A copy of the Manual and any other documentation requested by the FAA will remain available at all times. If for any reason a change was not amended in the Manual, the new limitations and conditions will be followed at the time of the review. The Operation will follow the Manual at all times.
7. A report will be attached to the Manual logging all revisions and changes to the Manual.
8. If a revision would change the Operation and potentially require a new revision, it is the responsibility of USAerobotix to contact the FAA UAS Integration Office (AFS-80) with all questions regarding the revisions.
9. The PIC must inspect the UAS and Ground Control Station ("GCS") before each flight to ensure a safe condition. If the PIC determines the condition to be unsafe, the aircraft will not perform the Operation and undergo the necessary maintenance required to perform a safe flight. A report of all maintenance performed will be included in the Manual.
10. If maintenance or alterations are made that affect the flight characteristics of the UAS, the PIC must perform a functional test flight. Procedures for these test flights are outlined in the Manual. These test flights must be logged into the flight records for the UAS and added to the Manual.
11. USAerobotix will follow the Manufacturer's UAS aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements. The Manual also outlines the aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements. At a minimum, the Manual must include the following:
    a. Actuators/servos
    b. Transmission (single rotor)
    c. Powerplant (motors)
    d. Propellers
    e. Electronic speed controller
    f. Batteries
    g. Mechanical dynamic components (single rotor)
    h. Remote command and control
    i. Ground control station
    j. Any other components as determined by either the Manufacturer or USAerobotix

12. The PIC must possess at least a private pilot certificate and at least a current third-class medical certificate. The PIC will also meet the flight review requirements specified in 14 C.F.R. § 61.56 in an aircraft in which the PIC is rated on his/her pilot certificate. If the FAA were to pass legislation for separate criteria for a UAS private pilot certificate, that may also be used. Similar level certification from the Department of Defense may also satisfy this requirement. USAerobotix also believes that the training and certification program outlined in the Manual is sufficient and could replace the Private Pilot Certificate requirement, upon the FAA's approval.
13. Prior to the Operation, the PIC must have accumulated and logged, in a manner consistent with 14 C.F.R. § 61.51(b), a minimum of 200 flight cycles and 25 hours of total time as a UAS rotorcraft pilot and at least ten hours logged as a UAS pilot with a similar UAS type (single blade or multirotor). Prior documented flight experience that was obtained in compliance with applicable regulations will be used to satisfy this requirement. Training, proficiency, and experience-building flights will be used with the UAS to accomplish these requirements. The training will be conducted in a controlled space, away from any non-participants by a minimum of 500 feet.
14. Prior to the Operation, the PIC must have accumulated and logged, in a manner consistent with 14 C.F.R. § 61.51(b), a minimum of five hours as UAS pilot operating the make and model of the UAS in this application for the use of the Operation and three take-offs and three landings in the preceding 90 days. Training, proficiency, experience-building, and take-off and landing currency flights will be conducted to accomplish these requirements; during these trainings, any non-participant must remain at least 500 feet away from the training area.
15. The PIC and VO of the Operation must successfully complete a qualification process outlined in the Manual. USAerobotix has developed a test included in the Manual to be successfully passed by all PIC and VO personnel before the Operation. A record of completion of this qualification process will be documented and made available to the Administrator upon request.
16. Prior to the Operation, a flight demonstration, administered by a USAerobotix-approved and qualified pilot must be successfully completed and documented. The documentation must be available for review upon request by the Administrator. Because the knowledge and airmanship test qualifications have been developed by USAerobotix, and there are no established practical test standards that support a jurisdictional FAA FSDO evaluation and approval of company designed examiners, USAerobotix will conduct these tests in accordance with the Manual.
17. The UAS will not be operated directly over any person, except authorized and consenting personnel necessary to the Operation, below an altitude that is hazardous to persons or property on the surface in the event of a UAS failure or emergency.
18. The Manual establishes safety parameters for participating persons who are authorized and consenting. These persons will be essential to the Operation.
19. The Operation will be conducted no closer than 500 feet away from non-participating persons, except those consenting to allow the Operation closer, in which case the Operation will be no less than 200 feet away from consenting non-participating persons.
20. As addressed in the Manual as a part of the preflight inspection, in the event that the UAS loses communications or Global Positioning System (GPS) signal, the UAS will be programmed to return to the pre-determined location within the security perimeter and land or be recovered.
21. The UAS is equipped to abort flight in the event of unpredicted obstacles or emergencies, as addressed in the Manual.

22. Each flight during the Operation will commence after 30 minutes or at 25% battery power, whichever occurs first.
23. USAerobotix must obtain an Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA) prior to conducting any operations. The COA will also require USAerobotix to request a Notice to Airmen (NOTAM) not more than 72 hours in advance, but not less than 48 hours prior to the Operation.
24. All aircraft used for the Operation must be identified by serial number, registered in accordance with 14 C.F.R. part 47, and have identification (N-Number) markings in accordance with 14 C.F.R. part 45, Subpart C. Markings must be as large as practicable.
25. USAerobotix must document and maintain a record of the UAS maintenance, preventative maintenance, alterations, status of replacement/overhaul component parts, and the total time in service of the UAS. These procedures are outlined in the Manual.
26. Each UAS used in the Operation must comply with the Manufacturer's Safety Bulletins.
27. USAerobotix includes technician qualification criteria in the Manual.
28. The preflight inspection procedures in the manual include inspecting and accounting for all discrepancies, logging all maintenance, and reviewing each mission prior to execution.
29. Before the Operation, the radio frequency spectrum used for operation and control of the UAS must comply with the Federal Communications Commission (FCC) or other appropriate government oversight agency requirements. Details of this adherence are in the Manual.
30. The documents required under 14 C.F.R. §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.
31. The UAS will remain clear and yield the right of way to all other manned operations and activities at all times for all reasons (including, but not limited to, ultralight vehicles, parachute activities, parasailing activities, hang gliders, etc.).
32. The UAS will not operate during night, as defined in 14 C.F.R. § 1.1. All operations will be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) will not be conducted.
33. The UAS will only be operated by the PIC from a stationary position and not in a moving device or vehicle.
34. The UAS 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.
35. The UAS will not operate in Class B, C, or D airspace without written approval from the FAA. The UAS may not operate within 5 nautical miles of the geographic center of a non-towered airport as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airport's management is obtained, and the operation is conducted in accordance with a NOTAM as required by the operator's COA. The letter of agreement with the airport management must be made available to the Administrator upon request.
36. 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. Further flight operations may not be conducted until the incident, accident, or transgression is reviewed by AFS-80 and authorization to resume operations is provided.

The following section will describe the extent of relief USAerobotix seeks in each section of 14 C.F.R. requested, as well as reasons why the exemption would not adversely affect safety or how the exemption would provide a level of safety at least equal to the existing rule:

1) **14 C.F.R. 21: Certification Procedures for Products and Parts**

   This section outlines requirements for the issue of design and production approvals, airworthiness certificates, and other airworthiness approvals. USAerobotix is aware that if an exemption is granted as per Section 333, an airworthiness certificate would be issued and a request for exemption from 21 is unnecessary. However, as outlined in the List of Limitations and Conditions in this application, as well as all of the Attachments to this application, including the Manual, USAerobotix seeks to uphold the same level or exceeded level of safety as described in Part 21 of 14 C.F.R.

2) **14 C.F.R. 45.23(b): Display of Marks**

   USAerobotix is aware that if an airworthiness certificate is issued as part of the exemption that this particular rule would not be necessary to request an exemption. The UAS described in this exemption is of a small size, but as the List of Limitations and Conditions #24 outlined in this application, we will satisfy the display of the N-number on the aircraft, as large as applicable.

   The UAS will be registered and have appropriate markings to determine the responsible party of the flight if a loss of the aircraft does occur. This condition offers accountability for the PIC and USAerobotix to ensure the utmost safety during the Operation.

3) **14 C.F.R. 61.113(a) & (b): Private Pilot Privileges and Limitations: Pilot in Command**

   These sections describe the limits of private pilots for non-commercial operations. The UAS is controlled remotely by the PIC during the Operation. The area of the Operation is a controlled space with granted permission by the client who owns the infrastructure being inspected. There are maximum approach distances explained in the Manual, as well as signage and warnings for those non-participants who are not trained on safety near the infrastructure. Therefore, the risk of harming non-participants is low, since their presence is often non-existent in the space near the infrastructure. Due to the nature of the Operation, which does not involve the carrying of persons (pilots, passengers, or otherwise), USAerobotix believes the same or exceeded level of safety can be achieved if the PIC had either a private or commercial pilot license. As the FAA has stated in Exemption 11062, the required areas of knowledge for a commercial versus private pilot cover the same fundamental principles.

   USAerobotix strongly believes that it is in the best interest of the FAA to provide a means of certification for UAS specifically. Within the provided Manual and other Attachments, USAerobotix has detailed a process for training personnel that will uphold a high level of safety, especially near areas with little collision risk, air traffic, and population.

4) **14 C.F.R. 91.119(c): Minimum Safe Altitudes: General; Over other than congested areas**

As noted in previous exemptions, since the airspace used for the Operation is in a controlled environment surrounding the infrastructure of electrical equipment, USAerobotix will already operate in accordance with most of 91.119. The key exemption sought in 91.119(c) is in regard to the altitude of, "…closer than 500 feet to any person, vessel, vehicle, or structure." Since we must be near the structure of the equipment being inspected for the Operation, and closer to consenting non-participants and participants, an exemption from this rule is desired. The Operation will be below 400 feet AGL, as stated in the List of Limitations and Conditions #3, unless permission is granted by the FAA for anything higher.

Regarding the speed and size of the UAS for the Operation, and how similar rules were passed for aircraft exceeding 4,000 lbs, this exemption will not endanger any persons, structures, or other aircraft. The conditions offered in this application, along with the rules and exemptions already passed by the FAA will still account for safety as the most paramount consideration in seeking exemption from this particular rule.

5) **14 C.R.R. 91.121: Altimeter settings**

Exemption from this rule is only sought due to the wording used within the rule. The UAS is equipped with a digital telemetric data feed of the barometric altitude down to the Ground Control Station, instead of a traditional altimeter onboard the aircraft. Prior to each flight, a zero altitude initiation point will be established and confirmed for accuracy by the PIC. Further description of the altimeter technology is described in the Manual. This will maintain the safety intended by 91.121 with respect to the remote operation of the UAS.

6) **14 C.F.R. 91.151(a): Fuel requirements for flights in VFR conditions**

The first part of this rule states that a flight may not begin unless there is enough fuel to fly 30 minutes after approximate arrival to landing. The battery used for the UAS lasts approximately 40 minutes after fully energized and with little payload. Given the technical limitations of the flight length of the UAS, and the proposed safety measures explained in the List of Limitations and Conditions #22, a longer time frame for flight in daylight VFR conditions is safe. Other exemptions passed by the FAA were granted the same exemption due to the same limitations. Any risk being mitigated by this rule for other aircraft is alleviated by the nature of the aircraft for the Operation in this application.

Limiting flights to whichever of 30 minute duration or 25% battery life reserve comes first should suffice for a high level of safety.

7) **14 C.F.R. 91.405(a); 14 C.F.R. 91.407(a)(1) & (2); 14 C.F.R. 91.409(a)(1) & (2); 14 C.F.R. 91.417(a) & (b): Maintenance and Inspections**

All of these regulations require aircraft operators and owners to inspect aircraft as required by

subpart E and must, between inspections, unless otherwise stated in paragraph (c), have discrepancies repaired as prescribed in Part 43. Because Part 43 applies only to aircraft with an airworthiness certificate, these sections will not apply. However, as stated in the List of Limitations and Conditions of this application, as well as the other Attachments, supporting documents, and the Manual, maintenance will remain to be an important part of the Operation. The UAS is very nimble and can be repaired very quickly, even on the field during the Operation. If mechanical issues do pass preflight inspection, because of the limited airspace and AGL of the Operation, a failure will not result in loss-of-life or put anyone in significant danger, as long as the Limitations and Conditions, the procedures outlined in the Manual, and any other conditions offered by the FAA are strictly followed. A log of all maintenance will be kept in the manual and made available to the Administrator any time it is requested.

USAerobotix applies for this exemption with the intention of performing the Operation safely and in the best interest of the public. Please review the Attachments provided as a part of this exemption. The ultimate goal of USAerobotix service is to provide a method of inspection for utility lines, towers, and substations, solar generating panels, wind generating farms, and any other infrastructure or equipment in use by the power industry. Utility inspections are performed by helicopters, usually at 50 knots from a great distance to review the tree clearance to high tension wires, and they will spot-check any structural abnormalities along the lines. If power did fail for any reason, the responsible companies oftentimes are unable to pinpoint the exact reason why a failure occurred. Inspection with UAS will provide a more thorough and safer means of inspection from the sky. The alternate method includes manned ground inspections, with personnel putting themselves and others at risk of death or serious injury by climbing a pole or tower to inspect parts of the infrastructure.

Wind generation farms need to inspect their blades to ensure no cracks or major damage exists, which could result in large debris catapulting from the equipment and destroying other property and risking the safety of persons near the infrastructure. UAS based inspections will provide a safe means of inspection, instead of a manned system of climbing each generator tower, then repelling down each blade. The risk is incredibly high, and maintaining what little safety they have is very time consuming. UAS-based inspection will result in a more efficient inspection process, allowing the generating company to find problems well before they happen and continue to deliver power to the consumer reliably. The safety of inspections are now the difference between falling 400 feet to the ground and a 4 pound UAS falling to the ground.

Solar energy farms often require infrared inspections. This process is time consuming and potentially dangerous for a helicopter at low altitudes. The risk of flight failure can result in loss of power to thousands of consumers, and a high risk for injury for the pilot. A small UAS, outfitted with the same payload, can accomplish the task much more safely and efficiently.

Other Operations may include flare stacks and other larger industrial infrastructure. For these Operations, aircraft that currently perform the inspection already seek approval from the FAA prior to inspection. Additionally, because these flights are often over facilities that have personnel, USAerobotix will greatly reduce the risk of injury or death to personnel involved in these inspections.

The Operation is focused on a closed environment without any risk to personnel. Transitions between flights do not require the use of airspace, as the UAS is carried to the desired area before it is flown. Any data collected during the Operation will be handed to the client and used strictly for inspection of the

equipment. The weight, speed, operating capacity, proximity to persons and structures, and the Limitations and Conditions expressed in this application, supplemented by the Manual and all other Attachments will be used to prove the safety of the NAS with respect to the Operation performed by USAerobotix using the UAS. This is considered to be adequate information to fulfill the necessary requirements of obtaining an exemption for commercial use of UAS by USAerobotix granted to the FAA in Section 333 of the Reform Act of 2012.

Sincerely,

Jason T. Adams
Vice President, USAerobotix LLC

Cc: David Furlong, Executive President
Jay Adams, President
Jacob Furlong, Vice President