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

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

May 8, 2015

Exemption No. 11509
Regulatory Docket No. FAA–2015–0481

Mr. Denny Roderick
Vice President
Aviation Systems Engineering Company
7255 Golden Wings Road, Suite 2
Jacksonville, FL 32244

Dear Mr. Roderick:

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 February 19, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Aviation Systems Engineering Company (hereinafter petitioner or operator) for an exemption. The exemption would allow the petitioner to operate an unmanned aircraft system (UAS) to conduct technical demonstrations and training.

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 a DJI Inspire T600 and DJI Phantom.

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, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

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

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

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

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, Aviation Systems Engineering Company 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, Aviation Systems Engineering Company 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 DJI Inspire T600 and DJI Phantom 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 5 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

ASEC
Aviation Systems Engineering Company

February 19, 2015

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

Electronically Submitted via www.regulations.gov

Regarding:

Exemption Request Pursuant To Section 333 of the FAA Reform Act of 2012 and Part 11 of the Federal Aviation Regulations (FAR) from 14 CFR Part 21; 61.113(a) and (b); 91.109(c); 91.119(c); 91.121; 91.151(a)(1); 91.405(a); 91.407(a)(1); 91.409(a)(1) and (2); 91.417(a) and (b).

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (Reform Act) and 14 CFR Part 11, Aviation Systems Engineering Company (ASEC) Incorporated, which is an owner and operator of small unmanned aircraft systems (sUAS) equipped to support technical demonstrations and training, hereby applies for an exemption from the listed Federal Aviation Regulations (FAR) to allow operation of its sUAS, so long as such operations are conducted within and under the conditions outlined herein or as may be established by the FAA as required by Section 333.

The granting of this exemption request will provide immediate benefit to the public, industry, academia, and government by providing safe and informative sUAS technical demonstrations and training by authorizing highly controlled sUAS operations within Class G airspace, at or below 400 feet above ground level (AGL), in line of sight of an FAA-certificated pilot during daylight hours and above controlled property.

ASEC's sUAS shall weigh less than 10 pounds including its payload. Small UAS will operate at no more than 50 knots and have the capability to hover and simultaneously move vertically and horizontally.

Operations would be conducted in controlled locations with the consent of the proper authorities. ASEC operations will be performed by certified pilots; this requirement ensures that the sUAS does not create a hazard to users of the national airspace system (NAS) or the public.

The grant of this exemption request is in the public interest, does not create a hazard to users of the NAS or the public, and does not pose a threat to national security.

In the following pages, ASEC addresses all areas of concern to include:

- Equivalent levels of safety
- Exemptions requested

The name and address of the applicant is:

ASEC, Inc.
Attention: Brent Klavon
Phone: 904-772-8442
Email: brent.klavon@asec-incorporated.com
Address: 7255 Golden Wings Road, Suite 2
Jacksonville, FL 32244

ASEC appreciates your consideration in this matter.

Sincerely,

Denny Roderick
Vice President
ASEC, Inc.

Included in this Exemption Letter:

- Table 1: Regulations for which exemptions are requested
- Appendix A:
  - ASEC sUAS Flight Operations Manual
  - ASEC sUAS Maintenance Program
  - ASEC sUAS Aircrew Training Program
- Appendix B: Aircraft Manufacturer's Users Guide

Technical Demonstrations and Training

Using small UAS serves the public interest:

- Demonstrations and training by a credentialed, experienced, and Safety Management System (SMS) disciplined flight company provide an ideal venue to discuss sUAS technology, review regulations, and promote safe sUAS operations.
- sUAS demonstrations and training promote STEM-related career paths and support workforce development.
- Demonstrations provide an opportunity to increase awareness of sUAS capability for academia, industry, and government to make informed decisions regarding sUAS program start-up or how to become a service provider.
- Demonstrations offer customer markets the opportunity to understand the capabilities and efficiencies of sUAS conducting an aerial survey with electro-optical (visual, infrared, and hyper-spectral spectrum) sensors.
- Delivering sUAS training by an experienced, professional, and skilled provider reduces risk to the customer and public.

Aviation Systems Engineering Company

Aviation Systems Engineering Company (ASEC), Inc. is a veteran-owned small business headquartered in Lexington Park, MD, with offices in Anacostia, VA, Jacksonville, FL, Dallas, TX, and Seattle, WA. ASEC has the required corporate capability and proven aviation processes, tools, and knowledge drawn from ten years of requirements development, acquisition support, systems engineering, policy management, flight test conduct, outreach, and operational experience. This background, along with a highly professional aviation-safety culture, makes ASEC an ideal candidate for being granted an exemption.

ASEC maintains a diversified technical staff that includes over 140 senior engineers, analysts, and operators, including former military personnel who boast decades of engineering, operational, and test experience. ASEC's flight department is led by senior aviators, United States Navy Test Pilot School (USNTPS) graduates, and instructors that bring decades of experience in the development and conduct of airborne operations relevant to the support of UAS operations. ASEC employees include experienced UAS and payload operators, airspace specialists, airfield site survey specialists, test and evaluation professionals, UAS subject-matter-experts, and range safety support personnel.

As corporate policy, ASEC operates to the standards developed and adopted by the International Business Aviation Council (IBAC) and all of its Member Associations, including the National Business Aviation Association (NBAA). These standards were developed using best practices common throughout the business aviation community and, as such, reflect the high standards of operational safety that we wish to achieve in this company. Our Flight Department is certified SMS Stage 2 compliant by the International Standard for Business Aircraft Operations (IS-BAO) and offers a high level of safety and professional flight services to support the research and development of new airborne technologies, payload integration and certification, and provisions for chase or surrogate aircraft. ASEC's best practices include FAA elements that supplement our UAS SMS approach. ASEC's Flight Department was one of the first Flight Test Research and Development organizations to implement IS-BAO's SMS practices and seek IS-BAO review and certification.

ASEC's Flight Operations Manual was the first ever reviewed by IS-BAO to address UAS operations.

In 2014, ASEC's SMS process was validated by NASA-Kennedy Space Center (KSC), demonstrating our ability to provide a broad spectrum of independent, meticulous, and analytical evaluation as well as range safety expertise and experience. ASEC led efforts to conduct multiple small UAS aviation events by providing demonstration planning, design, and execution for Space Florida in coordination with NASA-KSC, US Air Force 45th Space Wing, the FAA, and the Association of Unmanned Vehicle Systems International (AUVSI). ASEC conducted individual technical and training reviews for ten small UAS and their operators that included airworthiness assessments and risk analyses. ASEC organized and led numerous stakeholder briefings, developed processes and related documents, and provided the range safety team to direct all sUAS flight operations. As a member of the Mid-Atlantic Aviation Partnership supporting UAS Test Site, ASEC was requested to support sUAS requirements' development and range safety operations.

ASEC Corporate Aviation Safety and Compliance Culture

- ASEC personnel have limited their operation of sUAS to that of hobbyists or as employees performing duties in support of Department of Defense (DoD) or Department of Homeland Security (DHS) operations. To date, ASEC members have not engaged in any commercial activity to ensure its compliance with applicable FARs or local, state, and federal laws.
- ASEC has a detailed sUAS Flight Operations Manual, sUAS Maintenance Program, and sUAS Aircrew Training Program that it shall follow should this exemption be approved. All three documents are submitted with this request.

ASEC sUAS Description

- ASEC will operate DJI's Inspire and Phantom sUAS multirotor aircraft.
- DJI sUAS multirotor aircraft have fail-safe features to include geo fencing and lost-link-return-home capability. DJI is the manufacturer of multirotor aircraft weighing less than 25 pounds and has developed technology that enhances safe sUAS operations within the NAS.

Summary of sUAS Characteristics

Model	**Inspire T600**	
Weight (Battery Included)	2935 g	103.5 oz
		6.5 lb
Hovering Accuracy Vertical:	0.5 m	1.6 ft
Horizontal:	2.5 m	8.2 ft
Max Angular Velocity Yaw:	150°/s	
Max Tilt Angle	35°	
Max Ascent Speed	5 m/s	16.4 ft/s
Max Descent Speed	4 m/s	13.1 ft/s
Max Speed	22 m/s	72.2 ft/s
Max Flight Time	18 min	
Operating Temperature Range	-10 ° to 40 ° C	

Dimensions	438×451×301 mm	18×18×12 inches

Model	**Phantom**	
Weight (Battery Included)	<1000 g	35.2 oz
		2.2 lb
Hovering Accuracy Vertical:	0.8 m	2.6 ft
Horizontal:	2.5 m	8.2 ft
Max Angular Velocity Yaw:	200°/s	
Max Tilt Angle	45°	
Max Ascent Speed	6 m/s	19.6 ft/s
Max Descent Speed	6 m/s	19.6 ft/s
Max Speed	10 m/s	32.8 ft/s
Max Flight Time	15 min	
Operating Temperature Range	-10 ° to 50 ° C	
Diagonal Distance	350 mm	14 inches

Aircraft and an Equivalent Level of Safety

- ASEC proposes that the exemption requested apply to civil aircraft that have the characteristics and operate with the limitations listed herein.
- These limitations provide for at least an equivalent or higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to the already safe operations conducted with conventional aircraft.

This Exemption Request is for Use of sUAS subject to Extensive Operational and Safety Requirements

At a minimum, the limitations and conditions to which ASEC agrees to be bound when conducting commercial operations under an FAA issued exemption include:

- Operators
  - The sUAS pilot-in -command (PIC) shall possess, at a minimum, a private pilot certificate and current third-class medical certificate. The PIC shall 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.
  - The PIC shall be trained in the operation of the specific make and model of the sUAS being piloted and have successfully completed all required training.
  - The PIC shall have accumulated and logged, in a manner consistent with 14 CFR §61.51 (b), a minimum of 25 hours of total time as a sUAS rotorcraft pilot and at least five hours logged as a sUAS pilot with a similar sUAS type (multirotor or helicopter). Prior documented flight experience obtained in compliance with applicable regulations may satisfy this requirement.
  - The PIC shall have accumulated and logged, in a manner consistent with 14 CFR §61.51 (b), a minimum of five hours as sUAS pilot operating the make and model of sUAS to be utilized for operations under the exemption as well as three take-offs and three landings in the preceding 90 days.
  - Training, proficiency, and experience-building flights can also be conducted under this grant of exemption to accomplish the required flight cycles and flight time.
  - During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the sUAS with appropriate distance from nonparticipants in accordance with 14 CFR §91.119.
  - The sUAS Visual Observer (VO) shall meet all training requirements and be responsible for all of his or her duties as set forth by ASEC sUAS Flight Operations Manual.
  - The PIC and Sensor Operator (SO) will be designated before each flight. The minimum crew for each flight operation will consist of the sUAS PIC, the SO and the VO.
  - The PIC and SO remains within visual line of sight (VLOS) of each other and the VO and in direct verbal communication at all times.
  - Safety briefings are conducted before each day's activities to include, but not limited to:
    - Designated roles of PIC, SO, and VO
    - Risk management and mitigation

- Specifications and Design

- All sUAS flown under this exemption shall be less than 10 pounds including aircraft and payload. This exemption requests permission only with respect to the specific use of the DJI Inspire and Phantom models, each weighing less than 10 pounds including its payload.
- The radio frequency spectrum used for operation and control of the sUAS shall comply with the Federal Communications Commission (FCC) or other appropriate government oversight agency requirements.
- Maximum speed shall be less than 50 knots (84 ft/s).
- The sUAS shall be equipped with inertial navigation sensor(s) and gyroscopes. (IRS/IRU/Accelerometer/MEMS Gyroscopes).
- The sUAS shall be equipped with a compass (magnetometer/heading source).
- The sUAS shall be equipped with a global positioning system (GPS) guidance system.
- The sUAS shall be designed, should it lose communications or lose its GPS signal, to return to a predetermined location within a designated parameter and land or be recovered in accordance with ASEC's sUAS Flight Operations Manual.

- Maintenance
  - The sUAS shall be maintained in accordance with the manufacturer's recommendations and ASEC sUAS Flight Operations Manual and Maintenance Program.
  - ASEC will document and maintain a record of the sUAS maintenance, preventative maintenance, alterations, and status of replacement, overhauled component parts, and the total time in service of the sUAS. These records will be maintained at the principle base for operation for the life of the aircraft or as required by FAA regulations. See ASEC sUAS Flight Operations Manual and Maintenance Program for additional details.
  - ASEC shall comply with all manufacturer safety and service bulletins or equivalent documents pertaining to the sUAS aircraft.
  - The PIC shall perform a preflight inspection of the sUAS, controller, and ground control station prior to each flight to ensure it is operational with no discrepancies. The sUAS will only be operated when all systems are operating per manufacturer's specifications and in a discrepancy-free condition.
  - Maintenance or repairs that may affect the sUAS operation or flight characteristics shall undergo a functional test flight when required in accordance with manufacturer's recommendations and ASEC's sUAS Flight Operations Manual. This functional test flight shall be recorded in the sUAS's records. When the functional test flight is completed successfully, the sUAS can be returned to service by the PIC.
  - ASEC shall follow the manufacturer's sUAS maintenance, overhaul, replacement, inspection, and life limit requirements. When not provided by the

manufacturer, specifications for aircraft, component, overhaul, replacement, and inspection maintenance requirements shall be established and included in ASEC's sUAS Flight Operations Manual and Maintenance Program. At a minimum, the following inspections will be established:

- Actuators/servos
- Powerplant(s) (motors)
- Propellers
- Electronic speed controller(s)
- Batteries
- Remote controllers and ground control station

- All sUAS are identified by the serial number, registered in accordance with 14 CFR Part 47, and have identification (N-number) markings in accordance with 14 CFR Part 45.29, except with respect to the size of the markings. Markings shall be as large as practicable.

- Operations
  - All required permissions and permits shall be obtained from territorial, state, county, or city jurisdictions, including local law enforcement or other appropriate governmental agencies.
    - At least three days before a scheduled operational flight, ASEC shall submit a written plan of activities to the local flight standards district office (FSDO) with jurisdiction over the area of the proposed flight. This three-day notification may be waived with the concurrence of the FSDO. The plan of activities shall include at least the following information:
      - Dates and times for all requested flights
      - Name and phone number of ASEC sUAS Flight Operations
      - Name, certificate, and phone number of the responsible PIC
      - Make, model, and serial and N-number of sUAS to be used
      - Statement from ASEC that it will be operating on approved property, and if requested by the inspector, a list of who provided permission
      - Description of the flight activity, including maps or diagrams of any area over which flights will be conducted, the relationship of that area to any nearby city, town, etc., and the altitudes essential to accomplish the operation
      - Signature of exemption-holder or representative
    - Documents required under 14 CFR §91.9 and §91.203 shall be readily available to the PIC any time the aircraft is in operation. These documents shall be made available to the FAA Administrator or any law enforcement official upon request.
    - ASEC shall obtain an air traffic organization (ATO) issued certificate

of waiver or authorization (COA) prior to conducting any operations under this grant of exemption.

- ASEC shall also request a notice to airman (NOTAM) not more than 72 hours in advance of, but not less than 48 hours prior to, the operation.
- ASEC shall obtain the consent of all persons involved in the operation and ensure that only consenting persons be allowed within 500 feet of the operations area.

- The sUAS shall not operate within five nautical miles of the geographic center of any airport as designated on the 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. This letter of agreement with the airport management shall be made available to the FAA Administrator upon request.
- The sUAS will only operate within the lateral boundaries of approved property. An operations area within those boundaries will be established for each flight. These areas will be free of unnecessary hazards or risks and nonparticipating personnel.
- The sUAS shall only operate within a predefined operations area that shall be thoroughly inspected by the PIC for buildings, overhangs, obstacles, wires, poles, people, vehicles, sun angle, shadows, glare, reflective surfaces, clouds, smoke, and terrain among other potential hazards.
- Flights shall be conducted under day visual meteorological conditions (VMC).
    - In addition, the sUAS shall 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.
    - sUAS operations shall not be conducted during night, as defined in 14 CFR §1.1.
    - Flights shall not be conducted under special visual flight rules (SVFR).
- Flights shall be operated at an altitude at or below 400 feet above ground level (AGL), as indicated by the procedures specified in ASEC's sUAS Flight Operations Manual.
- The PIC shall be prohibited from operating the sUAS from any moving device or vehicle.
- The sUAS shall be operated within VLOS of the PIC.
    - The PIC shall maintain VLOS without the aid of telescopes, cameras, or other devices.
    - The PIC will maintain VLOS with their own vision, which includes the use of eyeglasses or corrective lenses as specified on the PIC's medical certificate.
- The sUAS shall remain clear and yield the right of way to manned operations and activities at all times including, but not limited to, ultralight vehicles,

parachute activities, parasailing activities, hang gliders, etc.

- ASEC will require the PIC, SO, and VO to have successfully completed a qualification process which will include ground and flight training, as outlined in the ASEC sUAS Aircrew Training Program.
- The PIC's primary responsibility is the safe operation of the sUAS while in flight.

- SUAS Flight Time and Flight Durations
  - DJI Inspire and Phantom operations complete within 15 and 18 minutes flight time or with 25% battery power remaining whichever occurs first.

Table 1

Regulations for Which Exemptions are Requested

Unless otherwise requesting an exemption, ASEC, the PIC, SO, VO, maintenance support, and the sUAS shall comply with all applicable parts of 14 CFR including, but not limited to, Parts 45, 47, 61, and 91.

ASEC is requesting exemptions from the following FAR to the extent necessary to enable the requested sUAS operations for the reasons detailed below.

Relief sought from 14 CFR	**ASEC Statement**
21	Stated Below
61.113(a) and (b)	Stated Below
91.119(c)	Stated Below
91.121	Stated Below
91.151(a)(1)	Stated Below
91.405(a)	Stated Below
91.407(a)(1)	Stated Below
91.409(a)(1) and (2)	Stated Below
91.417(a) and (b)	Stated Below

14 CFR 21 – Requirements to Secure Airworthiness Certificates

1. Airworthiness exemptions should be given because size, weight, and operation areas of the sUAS meet the level of safety necessary for exemption under Section 333 of the Reform Act.
2. FAA has the authority to exempt aircraft from airworthiness certificate requirements under the Act (49 U.S.C. § 44701 (f)) and Section 333 of the Reform Act.
3. See Grant of Exemptions: 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11111, 11112, 11114, 11136, and 11138.

14 CFR 61.113 (a) and (b) – Private Pilot Privileges and Limitations: Pilot in Command

1. Since there are no standards for private or commercial sUAS operations, ASEC requests to utilize at least private pilots with a third class medical in support of its own operations.
2. Knowledge of flight characteristics and the FARs, along with the ability to physically manipulate the controls of the sUAS are the critical aspects of the requested operation. ASEC can accomplish this by using a private pilot that has specific training on the sUAS aircraft and operates in accordance with the ASEC sUAS Flight Operations Manual, FARs, and local, state, and federal laws.
3. The risks associated with the operation of a sUAS are so diminished from the level of risk associated with commercial aviation operations contemplated by Part 61 when drafted, that allowing operations of the sUAS as requested with a private pilot as the

PIC exceeds the present level of safety achieved by 14 C.F.R. §61.113 (a) & (b).

4. See Grant of Exemptions: 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11111, 11112, 11114, 11136, and 11138.

14 CFR 91.119(c) – Requirements for Minimum Safe Altitudes for Civil Aircraft Operation

1. The sUAS will be operated at or below 400 feet AGL.
2. ASEC shall obtain the consent of all persons involved in the operation and ensure that only consenting persons be allowed within 500 feet of the operations area.
3. The sUAS will only operate within the lateral boundaries of approved property. An operations area within those boundaries will be established for each flight. These areas will be free of unnecessary hazards or risks and nonparticipating personnel.
4. Given the size, weight, speed, material, and operation of the sUAS aircraft, equivalent levels of safety will be achieved.
5. See Grant of Exemptions: 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11111, 11112, 11114, 11136, and 11138.

14 CFR 91.121 – Altimeter Settings

1. Since the sUAS will not have a barometric altimeter and may use a GPS altitude read-out indication instead, an exemption may be needed.
2. An equivalent level of safety will be achieved by the operator as the sUAS uses AGL height from its initialization/takeoff point.
3. See Grant of Exemptions: 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11136, and 11138.

14 CFR 91.151 (a) (1) – Fuel Requirements for Flights in VFR Conditions

1. ASEC feels an equivalent level of safety can be obtained by terminating the flight relative to specific aircraft fuel (battery power) requirements for the planned sUAS, the DJI Inspire. ASEC plans to terminate DJI Inspire and Phantom flight prior to 15 and 18 minutes respectively, or 25% remaining battery power, whichever occurs first.
2. Both the DJI Inspire and Phantom models have a second level of safety that is achieved through the use of an aircraft battery monitoring system. These aircraft systems alert the operator of low battery voltage and return the respective aircraft to its takeoff location before its battery capacity is depleted.
3. ASEC will not operate sUAS at night in accordance with 14 CFR 1.1
4. See Grant of Exemptions: 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11112, 11136, and 11138.

14 CFR 91.405 (a) – Maintenance Required

This section and Part 43 apply only to aircraft with an airworthiness certificate; therefore, these sections will not apply to our request.

ASEC and the aircraft manufacturer (DJI) are the most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition. This maintenance process allows

for an equivalent level of safety to be achieved due to the limited size, scope, and area of operations.

In the absence of regulatory provisions addressing sUAS required maintenance, see the ASEC sUAS Flight Operations Manual, ASEC sUAS Maintenance Program, and manufacturer's maintenance recommendations for requirements.

1. Maintenance will be accomplished by ASEC pursuant to the manufacturer's recommendations and ASEC's sUAS Flight Operations Manual and Maintenance Program.
2. Maintenance, preventive maintenance, rebuilding, and alteration will be successfully accomplished by trained personnel only.
3. The ASEC sUAS Flight Operations Manual and ASEC sUAS Maintenance Program detail how to enter work performed in the maintenance log for scheduled and unscheduled maintenance or functional test flights that are performed.
4. ASEC shall only operate its sUAS with all systems functioning per manufacturer's specification in a discrepancy-free condition.
5. Maintenance records will be maintained at the principle base for operation for the life of the aircraft or as required by FAR.
6. See Grant of Exemptions: 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11136, and 11138.

14 CFR 91.407 (a) (1) – Operation after Maintenance, Preventive Maintenance, Rebuilding or Alteration

This section and Part 43 apply only to aircraft with an airworthiness certificate; therefore these sections will not apply to our request.

ASEC and the aircraft manufacturer (DJI) are the most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition. These maintenance procedures allow for an equivalent level of safety to be achieved due to the limited size, scope, and area of operations.

In the absence of regulatory provisions addressing sUAS operation after maintenance, preventive maintenance, rebuilding, alteration or functional test flights, ASEC has developed requirements to address these topics. See the ASEC sUAS Flight Operations Manual, ASEC sUAS Maintenance Program, and Aircraft Manufacturer's Users Guide.

1. Maintenance will be accomplished by ASEC pursuant to the manufacturer's recommendations and ASEC's sUAS Flight Operations Manual and Maintenance Program.
2. Maintenance, preventive maintenance, rebuilding, and alteration will be successfully accomplished by trained personnel only.
3. Functional test flights will be performed by the PIC when required; the sUAS return to service only when a functional test flight is successfully completed. When a mechanical issue arises, the sUAS will land safely or be recovered within the operations area.

4. The ASEC sUAS Flight Operations Manual details how to enter performance of scheduled and unscheduled maintenance or functional test flights in the maintenance log.
5. ASEC shall only operate its sUAS with all systems functioning per manufacturer's specification in a discrepancy-free condition.
6. These records will be maintained at the principle base for operation for the life of the aircraft or as required by FAR.
7. See Grant of Exemptions: 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11136, and 11138.

14 CFR 91.409 (a) (1) and (2) – Inspections

This section and Part 43 apply only to aircraft with an airworthiness certificate; therefore these sections will not apply to our request.

ASEC and the aircraft manufacturer (DJI) are the most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition. These maintenance inspections allow for an equivalent level of safety to be achieved due to the limited size, scope, and area of operations.

In the absence of regulatory provisions addressing sUAS inspections, ASEC has developed requirements to address this topic. See the ASEC sUAS Flight Operations Manual, Maintenance Program, and Aircraft Manufacturer's Users Guide

1. Maintenance will be accomplished by ASEC pursuant to the manufacturer's recommendations and ASEC's sUAS Flight Operations Manual and Maintenance Program.
2. Maintenance, preventive maintenance, rebuilding, and alteration will be successfully accomplished by trained personnel only.
3. The ASEC sUAS Flight Operations Manual details how to enter performance of all inspections into the maintenance log.
4. Functional test flights will be performed by the PIC when required after inspections; the sUAS shall return to service when the flight is successfully completed. When a mechanical issue arises, the sUAS will land safely or be recovered within the operations area.
5. ASEC shall only operate its sUAS with all systems functioning per manufacturer's specification in a discrepancy-free condition.
6. These records will be maintained at the principle base for operation for the life of the aircraft or as required by FAR.
7. See Grant of Exemptions: 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11136, and 11138.

14 CFR 91.417(a) and (b) – Maintenance Records

This section and Part 43 apply only to aircraft with an airworthiness certificate; therefore these sections will not apply to our request.

ASEC and the aircraft manufacturer (DJI) are the most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition. These maintenance records allow for an equivalent level of safety to be achieved due to the limited size, scope, and area of operations.

In the absence of regulatory provisions addressing sUAS maintenance records, ASEC has developed requirements to address this topic. See the ASEC sUAS Flight Operations Manual and Maintenance Program.

1. Maintenance will be accomplished by ASEC pursuant to the manufacturer's recommendations and ASEC's sUAS Flight Operations Manual.
2. Maintenance, preventive maintenance, rebuilding, and alteration maintenance will be performed by trained personnel and detailed records entered in the respective aircraft maintenance log at the completion of each event. The ASEC sUAS Flight Operations Manual details how entries are to be made in the aircraft maintenance log for scheduled and unscheduled maintenance or functional test flights that are performed.
3. These records will be maintained at the principle base for operation for the life of the aircraft or as required by FAR.
4. See Grant of Exemptions: 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11136, and 11138.