Albany
Atlanta
Brussels
Denver
Los Angeles
Miami
New York

McKenna Long & Aldridge LLP
1676 International Drive • Penthouse
McLean, VA 22102
Tel: 703.336.8800
mckennalong.com

Northern Virginia
Orange County
Rancho Santa Fe
San Diego
San Francisco
Seoul
Washington, DC

Mark E. McKinnon
703.336.8708
Matthew J. Clark
703.336.8714

EMAIL ADDRESS
mmckinnon@mckennalong.com
mclark@mckennalong.com

December 3, 2014

U.S. Department of Transportation
Docket Management System
1200 New Jersey Ave., SE
Washington, DC 20590

Re: Petition of Auburn University Aviation Center, for an Exemption Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012

Dear Gentlemen:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 ("Reform Act") and 14 C.F.R. Part 11, Auburn University Aviation Center ("Auburn University") hereby applies for an exemption from the Federal Aviation Regulations ("FARs") identified below, to allow commercial operation of small unmanned aerial vehicles (*i.e.,* "small unmanned aircraft" or "UAS") as part of Auburn University's Flight Instruction Program.

This exemption is made based on information outlined in this Petition for Exemption, as well as the accompanying Auburn DJI Phantom 2 UAS Flight Operations Manual, Auburn DJI Phantom 2 UAS Aircraft Flight Manual (sometimes referred to collectively as "Auburn's Ops/Flight Manuals"), DJI Phantom 2 Vision + User Manual, Smart Flight Battery Safety Guidelines, Quick Start Guide, and Pilot Training Guide (collectively referred to as "Manufacturer's Manuals"). Auburn University submits these supporting materials as confidential documents pursuant to 14 C.F.R. § 11.35(b), as the materials contain confidential commercial and proprietary information that Auburn University has not and will not share with others. Additionally, these documents contain operating conditions and procedures that are not generally available to the public and are protected from release under the Freedom of Information Act, 5 U.S.C. § 552 *et seq.*, and any other requirements established by the FAA pursuant to Section 333 of the Reform Act.

For your convenience, this Petition is organized as follows:

I. DESCRIPTION OF PETITIONER

Auburn University has a rich aviation history and heritage. Auburn University Flight Education was established in 1941 as the Auburn School of Aviation. During World War II, the school trained civilian pilots for service in the Army Air Corps. Now, the primary Flight Education mission is to provide the Professional Flight Management degree students with a quality education in required ground and flight courses. Auburn students in other majors, Auburn faculty and staff and local citizens also earn their "wings" at Auburn. After decades of successful hires and graduates, Auburn and Flight Education have developed a solid reputation for excellence across the aviation industry.

Auburn University is dedicated to continuing to build a robust, visionary aviation and aerospace program that fosters economic development, discovers new products and processes, and creates opportunities for students. As part of this vision, Auburn University seeks an exemption for commercial operations of small UAS to conduct training courses to instruct students in the operation of unmanned aircraft and their associated systems.

In accordance with 14 C.F.R. § 11.81(a), Auburn University provides the following information in support of its Petition for Exemption.

The contact information for Petitioner is as follows:

Bill Hutto
Director
Auburn University Aviation Center
2150 Mike Hubbard Boulevard
Phone: (334) 844-1942
Fax: (334) 844-4272
Web: www.auburn.edu/aviationcenter
Email: huttowt@auburn.edu

II. DESCRIPTION PROPOSED OPERATION

Auburn University intends to establish a UAS Flight Instruction Program. This program will introduce students to the elements of UAS operation from a commercial and non-commercial perspective and how these operations must fit into the National Air Space System ("NAS"). All UAS training and instruction activities will occur under tightly controlled conditions on property that is more than five miles from any airport and is owned and controlled by Auburn University. Upon completion of Auburn University's Program, students will be provided with a Certificate of Completion. This "Certificate of Completion" does *not* permit the student to engage in commercial UAS activities that are not in accordance with the FARs, but

rather, is intended to be an acknowledgement that the student has successfully demonstrated a complete understanding of UAS operations from a NAS perspective.

Auburn University will serve students, federal, state, and local governments, and the aviation industry as a whole by pioneering UAS academic programs, enhancing relationships with government and industry, strengthening UAS flight operations and training, and collaborating with other academic institutions. This exemption request is an opportunity to not only prepare students for aviation and aerospace careers in the UAS industry, but also to collaborate with the FAA to study and address training and qualification needs specific to the UAS industry. Furthermore, Auburn University will coordinate and continuously update its curriculum to take advantage of new guidance and regulations proposed and implemented by the FAA. Auburn University is committed to ensuring that its instruction program not only is compliant, but always reflects best practices as UAS integration into the NAS proceeds.

III. RELEVANT STATUTORY AUTHORITY

This Petition for Exemption is submitted pursuant to Section 333(a) through (c) of the FAA Modernization and Reform Act of 2012 ("Reform Act"). Congress has directed the FAA "to safely accelerate the integration of civil unmanned aircraft systems into the national airspace system." Pursuant to Section 333 of the Reform Act, the FAA Administrator is to permit unmanned aircraft systems to operate in the NAS where it is safe to do so based on the following considerations:

- The UAS's size, weight, speed and operational capability;
- Operation of the UAS in close proximity to airports and populated areas; and
- Operation of the UAS within the visual line of sight of the operator.

Additionally, the FAA Administrator has general authority to grant exemptions from the agency's safety regulations and minimum standards when the Administrator decides a requested exemption is in the public interest. *See* 49 U.S.C. § 106(f) (defining the authority of the Administrator); 49 U.S.C. § 44701(f) (permitting exemptions from §§ 44701(a), (b) and §§ 44702 – 44716, *et seq.*). A party requesting an exemption must explain the reasons why the exemption: (1) would benefit the public as a whole, and (2) would not adversely affect safety (or how it would provide a level of safety at least equal to the existing rules). *See* 14 C.F.R. § 11.81 (petitions for exemption).

IV. AUBURN UNIVERSITY'S PROPOSED UAS OPERATIONS MEET THE REQUIREMENTS OF SECTION 333 OF THE REFORM ACT

Auburn University's proposed operations in this Petition for Exemption qualify for expedited approval pursuant to Section 333 of the Reform Act as each of the statutory criteria and relevant factors are satisfied.

A. Approval is Warranted Based on the UAS's Size, Weight, Speed, and Operational Capability

Auburn University will employ the DJI Phantom 2 Vision Plus quadcopter for the operations described in this Petition for Exemption. This UAS has a maximum take-off weight of less than 3 pounds. The flight speed is limited to a maximum of 33.5 miles per hour, and it will not be flown at an altitude that exceeds 400 feet AGL. All flights will be flown in such a way that they can be safely terminated with a reserve battery power of 25% of the battery's maximum charge. The DJI Phantom Vision II Plus does not carry any flammable propellant or fuel. The UAS also has an integrated GPS system that calculates the UAS's position and height and relays that information via a secure connection to the operator. Additionally, the UAS contains a failsafe mode if its connection to the remote control is lost, and this system permits the UAS to return to a predetermined location and land without injury or damage.

B. Approval is Warranted Based on the Operational Restrictions Set Forth in Auburn's Ops/Flight Manuals

Together, Auburn's Ops/Flight Manuals and the Manufacturer's Manuals contain all of the procedures and limitations necessary to successfully perform the operations specified in this Petition for Exemption. To assist the FAA in making a safety assessment of Auburn University's proposed operations, below is a summary of operational limitations and conditions which will ensure an equivalent or higher level of safety to operations conducted under current regulatory guidelines:

1. The UAS weighs 3 pounds or less.

2. Flights will be operated within the visual-line-of sight of a pilot and an observer.

3. Maximum total flight time for each operational flight will be limited to 25% reserve battery power remaining.

4. Flights will be operated at an altitude of no more than 400 feet AGL and will not be conducted within navigable controlled airspace without prior written authorization from the FAA.

5. Flights will be operated at a lateral distance of at least 500 feet from any persons, inhabited structures, vehicles or vessels that are not involved in the inspection unless permission has been received and appropriate waivers have been signed by the persons or property owners in advance.

6. Flights will be limited to a speed of 35 mph and vertical ascent will be limited to 15 mph.

7. The UAS will be operated and maintained in accordance with the requirements of the Manufacturer's Manuals and any manufacturer Safety Bulletins.

8. Prior to the operation, the flights will be fully preplanned and briefed, including possible contingencies and emergency procedures.

9. Auburn University will file a Notice to Airman ("NOTAM") with an appropriate air traffic control ("ATC") facility between 72 and 48 hours before the flight.

10. All required permissions and permits will be obtained from territorial, state, county or city jurisdictions, including local law enforcement, fire or other appropriate governmental agencies.

11. If the UAS loses communication with the pilot, it will have the capability to return to the sterile area home launch location or a pre-determined safe abort location.

12. Contingency plans will be in place to safely terminate flight if there is a loss of communication between the pilot and the observer.

13. The UAS will have the capability to abort flight in the case of unpredicted obstacles or emergencies.

14. All UAS operators and observers will have a Class III Medical Certificate.

15. All UAS operations will occur in daylight, Visual Flight Recognition ("VFR") conditions. IFR flights are prohibited and no flights will occur at night, or in adverse weather conditions.

16. The UAS will be controlled by the Phantom 2 2.4GHz Remote Control System and the radio frequency spectrum used for operation and control of the UA shall comply with the Federal Communications Commission ("FCC") or other appropriate government oversight agency requirements.

V. REGULATIONS FROM WHICH EXEMPTION IS SOUGHT

The Federal Aviation Act expressly grants the FAA the authority to issue exemptions. This statutory authority, by its terms, includes exempting civil aircraft, as the term is defined

under § 40101 of the Act, including UASs, from its safety regulations and minimum standards when the Administrator decides a requested exemption is in the public interest.[1]

Auburn University seeks an exemption from several interrelated provisions of 14 C.F.R. Parts 21, 45, 61 and 91 for purposes of conducting the requested operations using UAS. Listed below are: (1) the specific sections of 14 C.F.R. for which exemption is sought, and; (2) the operating procedures and safeguards that Petitioner has established which will ensure a level of safety better than or equal to the rules from which exemption is sought.[2]

A. 14 C.F.R. Part 21, Subpart H – Airworthiness Certificates and 14 C.F.R. § 91.203(a)(1)

The FAA has stated that no exemption is needed from this section if a finding is made under the Reform Act that the UAS selected provides an equivalent level of safety when compared to aircraft normally used for the same application. These criteria are met, and therefore no exemption is needed. *See* Grant of Exemption to Astraeus Aerial, Docket No. FAA-2014-0352 at 13-14, 22. If, however, the FAA determines that there are some characteristics of the chosen UAS that fail to meet the requirements of the Reform Act, an exemption is requested.

Equivalent Level of Safety

The UASs selected by Auburn University are safe when taking into account their size, weight, speed, and operational capability. As set forth in Section IV(B), *supra*, the UAS weighs less than 3 pounds and will be flown at less than 33.5 mph and completely outside controlled airspace. Additionally, the UASs carry neither pilots nor passengers, carry no explosive materials and or flammable liquid fuels, and operate exclusively within the parameters stated in Auburn's Ops/Flight Manuals.

Operations conducted under this exemption will be closely controlled and monitored by the operator and will be conducted in compliance with local public safety requirements, to provide security for the area of operation. Auburn University will also provide the FAA with advance notice of all operations via NOTAMS. In all cases, the UAS operated under the

---

[1] *See* 49 U.S.C. § 44701(f) (authorizing the grant of exemptions from requirements of regulations prescribed pursuant to Sections 44701(a) and (b) and Sections 44702 - 44716).

[2] *See* 14 C.F.R. § 11.81(e), which requires a petition for exemption to include:

> 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 you seek exemption.

proposed conditions, will be at least as safe as, or safer than conventional rotorcraft operating with an airworthiness certificate without the restrictions and conditions of the proposed UAS operations.

Further, the UAS does not need a means to communicate with other aircraft or ATC, because those capabilities will be possessed by the PIC and Observer, who are not onboard the UAS. *See* Grant of Exemption, Docket FAA-2014-0352 at 13. In addition, the UAS will be operated at all times in visual line-of-sight and in VFR conditions. *Id.*

B. 14 C.F.R. Part 27 Airworthiness Standards: Normal Category Rotorcraft

Title 14 C.F.R. Part 27 sets forth the procedural requirements for airworthiness certification of normal category rotorcraft. To the extent the Petitioner's UAS would otherwise require certification under Part 27, Petitioner seeks an exemption from Part 27's airworthiness standards for the same reasons identified in the request for exemption from 14 C.F.R. Part 21, Subpart H, *supra*.

C. 14 C.F.R. § 91.7(a): Civil Aircraft Airworthiness

Inasmuch as there will be no airworthiness certificate issued for the UAS Petitioner intends to use, Auburn University seeks an exemption from 14 C.F.R. § 91.7(a), which requires that a civil aircraft be in airworthy condition to be operated. The FAA has stated that no exemption is required for 14 C.F.R. § 91.7(a) to the extent that the requirements of Part 21 are waived or found inapplicable. *See* Grant of Exemption to Astraeus Aerial, Docket No. FAA-2014-0352 at 13-14, 22. Accordingly, Petitioner requests that the requirements for § 91.7(a) be treated in accordance with Section V(A), *supra.*

D. 14 C.F.R. § 91.9(b)(2): Civil Aircraft Flight Manual in the Aircraft and 14 C.F.R. § 91.203(a) and (b): Carrying Civil Aircraft Certification and Registration

Pursuant to 14 C.F.R. § 91.9(b)(2):

> (b) No person may operate a U.S.-registered civil aircraft –
> …
> (2) For which an Airplane or Rotorcraft Flight Manual is required by § 21.5 of this chapter, unless there is available in the aircraft a current approved Airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

Pursuant to 14 C.F.R. § 91.203(a) and (b):

> (a) Except as provided in § 91.715, no person may operate a civil aircraft unless it has within it the following:
>
> (1) An appropriate and current airworthiness certificate…
>
> (b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under § 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

Given the small size and configuration of the UAS, it would be impossible to keep airworthiness documents and other aircraft manuals on board the UAS because there is simply no room. Also the UAS has no cabin or cockpit.

Equivalent Level of Safety

In an FAA Office of Chief Counsel's Opinion dated August 8, 2014, and prepared by Dean E. Griffith, Attorney, AGC-220, it was acknowledged that the intent of 14 C.F.R. 91.9(b) and 91.203(a) and (b) is met if the pilot of the unmanned aircraft has access to the UAS flight manual, registration certificate, and other required documents from the ground control station from which he or she is operating the aircraft. As this FAA Office of Chief Counsel Opinion clarifies, the intent of the rule is to ensure the pilot has access to these key documents during flight. Therefore, an equivalent level of safety will be achieved be ensuring that the pilot has access to the documents at the ground control station from which he or she is piloting the UAS.

E. 14 C.F.R. §§ 91.9(c), 45.23(b) and 45.27(a): Aircraft Marking and Identification Requirements

Auburn University seeks an exemption from the aircraft marking and identification requirements contained in 14 C.F.R. §§ 91.9(c), 45.23(b) and 45.27(a).

- 14 C.F.R. § 91.9(c), Civil Aircraft Flight Manual, Marking and Placard requirements, provides that:

  > No person may operate a U.S.-registered civil aircraft unless that aircraft is identified in accordance with Part 45 of this chapter.

- 14 C.F.R. § 45.23(b), Markings of the Aircraft, states:

  > When marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted or light-sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot

> station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "light-sport, "experimental," or "provisional," as applicable.

- 14 C.F.R. § 45.27(a), Rotorcraft, states:

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

In a previous Grant of Exemption, the FAA determined that exemption from these requirements was warranted provided that the aircraft "have identification (N-Number) markings in accordance with 14 C.F.R Part 45, Subpart C if the markings are as large as practicable." FAA Docket No. FAA-2014-0352.

Equivalent Level of Safety

Auburn University will mark all UASs with their N-Number on the fuselage. The markings will be made as large as practicable.

F. 14 C.F.R. § 91.103: Preflight Action

Auburn University seeks an exemption from 14 C.F.R. § 91.103, which requires a PIC to become familiar with specific information before each flight, including information contained in the FAA-approved Flight Manual on board the aircraft. While the PIC will be familiar with all information necessary to safely conduct the flight, an exemption is requested to the extent that an FAA-approved Flight Manual is required.

Equivalent Level of Safety

An equivalent level of safety will be provided by following Auburn's Ops/Flight Manuals and the Manufacturer's Manuals. The PIC will perform a series of checklists in accordance with the Petitioner's Aircraft Flight Manual, including checklists covering Pre-Flight, Launch, Landing, After Landing, and Shut Down/Secure procedures.[3] The PIC will also be required to review weather, flight requirements, battery charge, landing and takeoff distance, aircraft performance data, and contingency landing areas - before initiation of flight. Auburn's Ops/Flight Manuals and the Manufacturer's Manuals will be kept at the ground control station and will be accessible to the PIC at all times while operating the UAS.

[3] *See* pages 11-12 of the Auburn DJI Phantom 2 sUAS Aircraft Flight Manual.

G. 14 C.F.R. § 91.109(a): Flight Instruction

Auburn University seeks an exemption from 14 C.F.R. § 91.109(a), which provides that "[n]o person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls." UASs and remotely piloted aircraft, by their design, do not have functional dual controls. Instead, flight control is accomplished through the use of a device that communicates with the aircraft via radio communications. Accordingly, an exemption will be required for the flight instruction requirements of 14 C.F.R. § 91.109(a).

Equivalent Level of Safety

Given the size and speed of the UAS that Auburn University intends to use, an equivalent level of safe training can still be performed without dual controls because no pilot or passengers are aboard the UAS, and as required by Auburn's Ops/Flight Manuals, all persons will be a safe distance away in the event that the UAS experiences any difficulties during flight instruction. Moreover, Petitioner will conduct training in a controlled and sterile environment. As required by Auburn's Ops/Flight Manuals, training and instruction will be conducted in a sterile area on property that is owned and controlled by Auburn University. These facilities will not be open to the public during UAS operations, and access will be restricted to authorized Auburn University personnel and students enrolled in the UAS course.

As required by Auburn's Ops/Flight Manuals, the Flight Training Team will be composed of a PIC, Visual Observer, Student, Instructor, and Flight Examiner.[5] Designated Instructors and Examiners are required to be an FAA licensed airman with at least a private pilot's certificate and have a Class III Medical Certificate. Further, all Instructors and Examiners must have successfully passed a written and/or oral exam covering Auburn University's UAS operations per Auburn's Ops/Flight Manuals. Instructors and Examiners are also required to pass a practical exam covering operations of the aircraft being used to perform the proposed operations in this Petition for Exemption. As a whole, the safety procedures provided for in Auburn's Ops/Flight Manuals ensure that the proposed UAS operations provide an equivalent or higher level of safety than the flight instruction regulations.

H. 14 C.F.R. § 91.119: Minimum Safe Altitudes

Auburn University requests an exemption from the minimum safe altitude requirements of 14 C.F.R. § 91.119. Section 91.119 prescribes the minimum safe altitudes under which aircraft may not operate, including 500 feet above the surface and away from any person, vessel, vehicle, or structure in non-congested areas. *See* 14 C.F.R. § 91.119(c). Section 91.119(d)

---

[5] *See* pages 33-34 of the Auburn DJI Phantom 2 sUAS Flight Operations Manual.

allows for a helicopter to operate at less than those minimum altitudes when it can be operated "without hazard to persons or property on the surface," provided that "each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA."

An exemption is required because the proposed UAS operations will need to occur below 400 feet AGL. Further, due to the nature of the proposed operations, the PIC, Observer(s), Instructor and/or Student may at times be less than 500 feet away from the UAS.

Equivalent Level of Safety

Compared to flight operations with rotorcraft weighing far more than the maximum weights proposed herein, and given the lack of flammable fuel with the UASs, any risk associated with these operations is far less than those that presently exist with conventional aircraft. An equivalent level of safety will be achieved given the size, weight, and speed of the UASs, as well the controlled and sterile location where the operations will occur. In order to avoid any risk to manned aircraft, flight operations will be restricted to 400 feet AGL or below. As set forth in Auburn's Ops/Flight Manuals, the UASs will be operated in a restricted area that is owned or controlled by Auburn University. These restrictions will ensure that the proposed UAS operations are performed in a manner that protects the safety of participants, non-participants, the UAS and other property.

I. 14 C.F.R. § 91.121: Altimeter Settings

This petition seeks an exemption from 14 C.F.R. § 91.121, which requires a person operating an aircraft to maintain cruising altitude or flight level by reference to an altimeter that is set to the elevation of the departure airport or barometric pressure. An exemption is required to the extent that the UASs do not have a barometric altimeter, but rather a GPS altitude read out.

Equivalent Level of Safety

The FAA has stated that an equivalent level of safety to the requirements of 14 C.F.R. § 91.121 can be achieved in circumstances where: (1) the UASs will be operated at 400 feet AGL or below, (2) within visual line-of-sight, (3) where GPS based altitude information is relayed in real time to the operator at a ground-based on-screen display and, (4) where prior to each flight, a zero altitude initiation point is established for the PIC to confirm accuracy of the onboard GPS. *See* Grant of Exemption to Astraeus Aerial, Docket No. FAA-2014-0352 at 21.

As the attached Auburn Ops/Flight Manuals and Manufacturer's Manuals demonstrate, the UASs Auburn University intends to use meet these requirements. Moreover, Auburn University's Aircraft Flight Manual includes GPS compass calibration procedures that must be

performed prior to each flight. Like Astraeus Aerial's petition for exemption, the UASs Auburn University intends to use, and the safety procedures contained in Auburn's Ops/Flight Manuals, both ensure that an equivalent level of safety will be achieved, and a grant of exemption to the requirements of § 191.121 is therefore appropriate.

J. 14 C.F.R. § 91.151(a): Fuel Requirements for Flight in VFR Conditions

Auburn University requests an exemption from 14 C.F.R. § 91.151(a)'s fuel requirements for flight in VFR conditions. Section 91.151 states:

> (a) No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed –
>
> (1) During the day, to fly after that for at least 30 minutes; or
>
> (2) At night, to fly after that for at least 45 minutes.

Here, the technological limitations on UAS battery power means that no meaningful flight operations can be conducted while still maintaining a 30 minute battery reserve. An exemption from the fuel requirements of 14 C.F.R. § 91.151(a) is therefore required.

Equivalent Level of Safety

The FAA has stated that an equivalent level of safety can be achieved by requiring that each UAS operation be completed within 30 minutes flight time or with 25% battery power remaining, whichever occurs first. *See* Grant of Exemption to Astraeus Aerial, Docket No. FAA-2014-0352. Auburn's Ops/Flight Manuals include a similar restriction which requires UAS flight operations to be terminated once 25% battery power reserve is reached.

The UAS that Auburn University intends to use has a low battery capacity warning system. Telemetry data is downlinked from the UA to the ground control station which will alert the PIC when remaining battery power drops below 30%. Consistent with the procedures in Auburn's Ops/Flight Manuals, the PIC will promptly fly the UA back to the home launch location or pre-determined abort location where the UA may safely land. Together, the safety procedures required in Auburn's Ops/Flight Manuals, and the design features of the selected UAS, ensure that the proposed operation will provide an equivalent level of safety to that provided by the regulations.

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

Auburn University seeks an exemption from the maintenance inspection requirements contained in 14 C.F.R. § 91.405(a), 91.407(a)(1), 91.409(a) (1) & (2); 91.417(a) and (b). These regulations specify maintenance and inspection standards in reference to 14 C.F.R. Part 43. *See, e.g.,* 14 C.F.R. § 91.405(a) (stating that each owner or operator of an aircraft "[s]hall have the aircraft inspected as prescribed in subpart E of this part and shall between required inspections …have discrepancies repaired as prescribed in part 43 of this chapter"). An exemption from these regulations is needed because Part 43 and these sections only apply to aircraft with an airworthiness certificate, which the UAS Auburn University intends to use will not have.

Equivalent Level of Safety

An equivalent level of safety will be achieved because maintenance and inspections will be performed in accordance with the Manufacturer's Manuals and any applicable manufacturer Safety Bulletins. Further, as required by Auburn's Ops/Flight Manuals, flights will not be conducted unless a pre-flight checklist covering all flight critical components of the UAS has been completed. Auburn's Ops/Flight Manuals also contains recordkeeping requirements for routine, interval and post-flight maintenance. As a whole, the maintenance and inspection procedures required in Auburn's Ops/Flight Manuals ensure that an equivalent or higher level of safety will be achieved.

L. 14 C.F.R. Part 61, 14 C.F.R. § 61.3, 14 C.F.R. § 61.113: Private Pilot Privileges And Limitations

Auburn University will require its flight instructors to have a private pilot's license. However, as set forth in the accompanying Manuals, flight instruction will also be provided to students who will not have a private pilot's license. Accordingly, Auburn University seeks exemption from 14 CFR Part 61, including 14 CFR § 61.3 to the extent that these regulations are interpreted as requiring a student receiving UAS pilot instruction to have a private pilot's certificate. All student instruction flights will be conducted under closely controlled circumstances, outside of navigable airspace and away from persons or property not involved in the instruction. In addition, the student instruction flights will be conducted under the close supervision of a flight instructor, who will have a private pilot's license.

In addition, to the extent that Auburn University will be employing persons with a private pilot's license to operate its UAS, an exemption is also sought from 14 C.F.R § 61.113, which restricts private pilot certificate holders from flying aircraft for compensation or hire, and which would also require a second class medical certificate. The purpose of this section is to ensure the

skill and competency of any PIC where the aircraft is carrying passengers or cargo for hire. In this case, while Instructors[6] or Flight Examiners acting as PIC of the Flight Training Team will be operating UASs for a commercial purpose as part of Auburn University's Flight Instruction Program, the UASs carry neither passengers nor cargo.[7] Moreover, in the Astraeus Aerial Grant of Exemption (FAA Docket No. FAA-2014-0352), the FAA determined that the unique characteristics of UAS operation outside of controlled airspace did not warrant the additional cost and restrictions attendant with requiring the PIC to have a Commercial Pilot Certificate and Class II Medical Certificate.

Equivalent Level of Safety

Auburn University will ensure and equivalent level of safety to the regulatory requirements of 14 C.F.R. Part 61, including 14 C.F.R. §§ 61.3 and 61.113 by following the safety procedures provided in Auburn's Ops/Flight Manuals. Specifically, the sUAS Flight Instruction procedures and Flight Training Team protocols contained in Paragraphs 7 and 16 of Auburn's sUAS Flight Operations Manual include numerous conditions and limitations which ensure the proposed UAS operations can be conducted safely. These include a minimum of a Class III Medical Certificate for all flight personnel, including students, a demonstration of proficiency through written/oral examination covering all flight operations.

In addition to these training and experience requirements, Auburn University has placed additional restrictions on its proposed UAS operations to ensure an extra margin of safety. The UAS will only operate in a controlled and sterile area away from persons and property not involved in the operation. As required in Auburn's Ops/Flight Manuals, the PIC will maintain a 500 foot buffer from non-participating personnel, as well as buildings, vessels and vehicles that are not part of the UAS operation being conducted. It will be flown based on VLOS at 400 feet AGL or below. Auburn University will also file a NOTAM with the appropriate ATC facility between 48 and 72 hours before the flight is to occur. Auburn's Ops/Flight Manuals, including its qualification, currency and training requirements for members of Auburn's Flight Instruction Program, ensure that UAS operators are competent and proficient in the UAS they are operating. Collectively, these procedures ensure that the proposed UAS operations can be conducted safely

VI. **PUBLIC INTEREST**

---

[6] Instructors are defined as: "The individual receiving instruction covering sUAS operation as provided by Auburn University." Auburn DJI Phantom 2 sUAS Aircraft Flight Manual at ¶16.2.1.4.1.1.

[7] Student operators participating in Auburn University's Flight Instruction Program will *not* operate UAS for compensation or hire.

The public interest will be served by granting Auburn University's Petition for Exemption. Congress has established a national policy that favors early integration of UAS into the National Airspace System ("NAS") in controlled, safe working environments such as those proposed in this Petition. Granting this Petition for Exemption helps fulfill Congress' goal in passing Section 333(a) through (c) of the Reform Act, namely; the FAA Administrator's assessment of whether certain UAS may operate safely in the NAS before completion of the rulemaking required under Section 332 of the Reform Act.

The proposed UAS operations in this Petition for Exemption will benefit students, federal, state, and local governments, and the aviation industry as a whole by pioneering UAS academic programs that focus on the safe integration of UAS into the NAS. This Petition for Exemption offers the FAA and opportunity to collaborate with an academic institution that has decades of experience and a solid reputation for excellence throughout all facets of the aviation industry. The public as a whole will benefit from a collaborative relationship between the FAA and Auburn University that focuses on the safe promotion of best practices for training and qualification needs specific to the UAS industry.

The proposed UAS operations in this Petition for Exemption will also improve safety and reduce risk by alleviating the public's exposure to danger associated with student flight training utilizing full size fixed-wing aircraft and rotorcraft. The UASs Petitioner intends to use are battery powered and create no emissions. Moreover, in the unlikely event that one of Petitioner's UASs crash, there is no fuel to ignite and explode. Any accident involving Petitioner's lightweight UASs will present significantly less danger to the pilot and other individuals on the ground than one involving a full size helicopter.

VII. PRIVACY

All Auburn University UAS operations shall be conducted in accordance with applicable federal, state, or local laws regarding privacy. Auburn University will not conduct flight operations over property that it does not own or control without the prior consent and knowledge of the property owner. Moreover, Auburn University will not capture or use images from neighboring properties within the vicinity of UAS flight operations.

VIII. FEDERAL REGISTER SUMMARY

Pursuant to 14 C.F.R. Part 11, the following summary is provided for publication in the FEDERAL REGISTER, should it be determined that publication is needed:

Petitioner seeks an exemption from the following sections in Title 14 of the Code of Federal Regulations:

Part 21, Subpart H; Part 27; 45.23(b); 45.27(a); 61.3; 61.113; 91.7(a); 91.9(b)(2); 91.9(c); 91.103; 91.109(a); 91.119; 91.121; 91.151(a); 91.203 (a) & (b); 91.405(a); 91.407(a)(1); 91.409(a)(1) & (2); 91.417 (a) & (b).

The exemption will enhance safety by reducing risk to the general public and property owners from the substantial hazards associated with performing equivalent flight training with conventional fixed-wing aircraft, rotorcraft, or other methods.

IV. CONCLUSION

Auburn University's Petition for Exemption satisfies the criteria articulated in Section 333 of the Reform Act of 2012 including weight, speed, operating capabilities, proximity to airports and populated areas, operation within visual line-of-sight and national security. The proposed UAS operations will benefit the public as a whole by fostering a collaborative relationship between the FAA and Auburn University which focuses on UAS training, qualifications, and processes involving the safe and efficient operation of UAS in the NAS.

In consideration of the foregoing, Auburn University's Petition for Exemption provides the FAA with more than adequate justification for granting of the requested exemptions allowing Auburn University to perform commercial operations as part of Auburn University's Flight Instruction Program.

Should you have any questions, or if you need additional information to support the requested exemptions, please contact the undersigned or John McGraw at:

John McGraw Aerospace Consulting, LLC
Phone: 540-219-1638
Email: john@jmacaerospace.aero

Very truly yours,

/s/ Mark E. McKinnon

Mark E. McKinnon
Matthew J. Clark
Counsel for Petitioner

Attachments

(The following attached items contain proprietary and commercial information exempt from disclosure under the Freedom of Information Act, 5 U.S.C. § 522 *et seq.*, and should be held in a separate file pursuant to 14 C.F.R. § 11.35(b)).

Attachment A: Auburn DJI Phantom 2 sUAS Flight Operations Manual

Attachment B: Auburn DJI Phantom 2 sUAS Aircraft Flight Manual

Attachment C: DJI Phantom 2 Vision + User Manual

Attachment D: DJI Smart Flight Battery Safety Guidelines

Attachment E: Phantom 2 Vision + Quick Start Guide

Attachment F: Phantom 2 Vision + Pilot Training Guide