Exemption No. 17067

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, DC 20591

In the matter of the petition of **FLORIDA STATE UNIVERSITY** for an exemption from part 21 Subpart H, and §§, 45.23(b), 61.3(d)(2)(iii), 61.113(a) and (b), 91.7(a) and (b), 91.9(b)(2), 91.103, 91.109, 91.119(b) and (c), 91.121, 91.151(a)(1), 91.203(a) and (b), 91.405(a) and (b), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b) of Title 14 Code of Federal Regulations	**Regulatory Docket No. FAA−2015−0621**

GRANT OF EXEMPTION

By letter dated March 10, 2015, Ausley McMullen, on behalf of Florida State University (hereinafter petitioner or operator), 123 South Calhoun Street, Tallahassee, Florida 32301, petitioned the Federal Aviation Administration (FAA) for an exemption from part 21 Subpart H, and §§, 45.23(b), 61.3(d)(2)(iii), 61.113(a) and (b), 91.7(a) and (b), 91.9(b)(2), 91.103, 91.109, 91.119(b) and (c), 91.121, 91.151(a)(1), 91.203(a) and (b), 91.405(a) and (b), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b) of Title 14 Code of Federal Regulations (14 CFR). The petitioner requested to operate several unmanned aircraft systems (UAS) to conduct flight instruction of UAS.

On April, 1, 2015, the petitioner submitted a letter supplementing its exemption request in order to officially request a "blanket" COA. The letter included an attachment of their COA requests submitted to the FAA.

On November 9, 2015, the petitioner submitted a letter entitled "second supplement" in order to request to amend its exemption request. The petitioner provided an update to its scope of operations proposing to conduct applied research of UAS. The FAA considers applied research to be in alignment with aerial data collection under this exemption.

The petitioner supports its request with the following information:

The petition for exemption describing the proposed operation and the regulations from which the petitioner seeks exemption is posted to the docket. To view the petition, visit http://www.regulations.gov, enter the regulatory docket number found on the first page of this document into the search box and click "Search," then click on the "Open Docket Folder" link next to a result associated with the docket number.

The petitioner is the research center of the Florida State University Emergency Management and Homeland Security Program (EMHS). The petitioner focuses on disaster management and technical assistance in support of the EMHS program, government agencies, and non-governmental agencies. The petitioner has conducted research into utilizing small UAS in support of emergency and disaster managers. The FAA has granted a Certificate of Waiver or Authorization for research activities in eastern Tallahassee, Florida.

The petitioner has provided the following information along with its petition to support its request for an exemption:

1) FAA UAS COA 2014 ESA 109
2) 2 pending COA requests
3) Center for Disaster Risk Policy UAS Standard Operating Guide
4) IRIS + Operation Manual
5) IRIS + Flight Checklist
6) 3DR DIY Y6 Build Manual
7) Y6 Checklist
8) LYNX UAS Manual
9) LYNX UAS Checklist
10) PKZ4700 Radian Manual

The petition and the documents above are hereinafter referred to as the operating documents.

Discussion of Public Comments:

A summary of the petition was published in the Federal Register on January 21, 2016 (81 FR 3556). No public comments were received.

The FAA's analysis is as follows:

The FAA has organized its analysis into five sections: (1) Unmanned Aircraft Systems (UAS), (2) the UAS pilot in command (PIC), (3) Training Operations, (4) the UAS operating parameters, and (5) the public interest.

Unmanned Aircraft Systems (UAS)

In accordance with the statutory criteria provided in Section 333 of PL 112-95 in reference to 49 USC 44704, and in consideration of the size, weight, speed, and limited operating area associated with the aircraft and their operation, the Secretary of Transportation has determined that these aircraft meet the conditions of Section 333 and that an airworthiness certificate is not required. 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 petitioner proposed to use UAS that have been previously approved by the Secretary of Transportation under Section 333 of the FAA Modernization and Reform Act of 2012. UAS that have been previously approved by the Secretary, including the aircraft proposed by the petitioner, are found on the List of Approved Unmanned Aircraft Systems (UAS) under Section 333. The list, which is updated monthly, is posted at www.regulations.gov under docket number FAA-2007-3330. The petitioner is also authorized to operate any UAS on that list, when weighing less than 55 pounds including payload while this exemption is valid.

The Section 333 determination made by the Secretary of Transportation and the risk mitigations established through the Conditions and Limitations contained in each exemption ensure that the authorization of all aircraft on this list will not have an adverse impact on safety.

The petitioner's requested relief from 14 CFR § 45.23(b), Display of marks: general, is not necessary because its UAS will not be certificated under 14 CFR § 21.191. The petitioner's

UA must be identified by serial number, registered in accordance with 14 CFR parts 47 or 48, and have identification markings as required by 14 CFR part 45, Subpart C[1] or part 48.

The petitioner requested relief from the following sections 14 CFR §§ 91.405(a) *Maintenance required*, 91.407(a)(1) *Operation after maintenance, preventive maintenance, rebuilding, or alteration*, 91.409(a)(1) and (2) *Inspections*, and 91.417(a) and (b) *Maintenance records*. Prior UAS specific relief has been granted in Grant of Exemption No. 11213 to Aeryon Labs, Inc. Therefore the FAA finds that exemption from 14 CFR §§ 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b) is warranted subject to the conditions and limitations below.

Additionally, the FAA has added a condition to this exemption stating that, consistent with existing law, the operator will need to obtain a Foreign Aircraft Permit pursuant to 14 CFR § 375.41 if it will be using foreign civil aircraft[2] in its operations.

UAS Pilot in Command (PIC)

The petitioner stated that all its UAS pilots will possess a private pilot certificate and third class medical certificate. The petitioner also stated that its pilots will have completed the petitioner's training program for operation of their sUAS in accordance with the operating documents prior to instructing. The petitioner further stated that if current Section 333 exemptions are issued that would allow a lesser pilot certification level, then the petitioner requests exemption from the relevant sections of the regulations.

In this exemption the FAA is exempting FSU pilots from the prohibition on receiving compensation for providing UAS flight training to non-certificated student pilots. As in previously issued exemptions, FSU pilots will be required to hold an FAA pilot certificate. We note that during these operations, the PIC is responsible for the safety of flight regardless of whether the PIC or the student is manipulating the aircraft controls.

FSU has stated that all of its pilots will hold at least a private pilot certificate with a third class airman medical certificate. In Exemption No. 13465 to Kansas State University, the FAA found that UAS PICs conducting UAS training operations must hold either an airline transport, commercial, private, recreational, or sport pilot certificate along with a current FAA airman medical certificate or a valid U.S. driver's license. Therefore, as in Exemption No.

[1]Markings must be as large as practicable per § 45.29(f). An exemption from 14 CFR § 45.27 would not be necessary because of the allowance in § 45.29(f).

[2] *Foreign civil aircraft* means (a) an aircraft of foreign registry that is not part of the armed forces of a foreign nation, or (b) a U.S.-registered aircraft owned, controlled or operated by persons who are not citizens or permanent residents of the United States. 14 CFR §375.1.

13465, FSU instructors that will serve as PICs under operations conducted under this exemption may hold any of those pilot certificates.[3]

14 CFR §1.1 defines a PIC as the person who has final authority and responsibility for the operation and safety of the flight, has been designated as pilot in command before or during the flight, and holds the appropriate category, class, and type rating, if appropriate for the conduct of the flight. Accordingly, based on FSU's request, the FAA grants relief from §§ 61.101(e)(4) and (5), and 61.113(a), to allow a PIC holding a private pilot certificate to operate a UAS for compensation and hire, subject to the conditions and limitations below.[4] The petitioner also requested relief from § 61.113(b); however relief is not necessary since relief is already granted to § 61.113(a). The FAA is also granting relief from § 61.315(a) as previously determined in Exemption No. 11213, to permit the holder of a sport pilot certificate to act as the PIC of UAS operated under this exemption.

Additionally, the PIC must hold either a medical certificate issued under 14 CFR part 67 or a U.S. issued driver's license as previously determined in Exemption No. 11213. The PIC must also comply with 14 CFR § 61.53, *Prohibition on operations during medical deficiency*. *See* Exemption 11213 (Aeryon Labs) for relief granted from *Medical certificates: Requirement and duration* § 61.23(a) and § 61.23(c).

The FAA also considered medical certificate requirements for a visual observer. As in Exemption No. 11213, the FAA determined that this is not necessary subject to the conditions and limitations below. In particular, the UA must never be operated beyond the actual visual capabilities of the VO, and the VO, any student manipulating the controls, and the PIC must have the ability to maintain VLOS with the UA at all times. It is the responsibility of the PIC to be aware of the VO's visual limitations and limit operations of the UA to distances within the visual capabilities of both the PIC and VO.

The petitioner also requested relief from 14 CFR § 61.3(d)(2)(iii), *Requirements for certificates, ratings, and authorizations.* Given that the training the petitioner intends to provide is not for an FAA airman certificate and the log books recording training given are not part of an FAA certificate program, the FAA finds that relief from 14 CFR § 61.3(d)(2)(iii) is not necessary.

Training Operations:

[3] Note that, as discussed under Training Operations, below, a FSU instructor will be required to serve as PIC during student training flights even when students are manipulating the aircraft's controls.

[4] Similar relief from § 61.315(c)(2) and (3) is not necessary because these limitations on sport pilot certificate privileges only apply to light-sport aircraft (LSA). The UAS being operated under this exemption are not LSA.

The petitioner proposes to conduct flight operations to provide UAS training or instruction to non-certificated persons for compensation or hire. The proposal included training scenarios with a trainer holding a private pilot certificate and third class airman medical certificate serving as the PIC. The FAA is granting the exemption to permit FSU instructors to receive compensation for providing flight instruction to students.

These operations will be consistent with the FAA's approach for student pilots of manned aircraft. Student pilots may manipulate the controls of an aircraft in most part 91 operations unless specifically restricted. Students do not need to obtain a medical certification or pass a knowledge test prior to flights where a qualified instructor serves as the PIC. *See* 14 CFR § 61.87. When a student, or other non-qualified person, is manipulating the controls of an aircraft, the PIC retains responsibility for the safety of the flight. Student flight operations under this exemption must always be conducted under the supervision of a PIC and the PIC must always have the ability to immediately take direct control of the aircraft.

The instructor is designated the PIC for the entire duration of the operation. Students are not required to hold any certification to manipulate the controls of an unmanned aircraft under this exemption. However, the PIC must have sufficient override capability to immediately take direct control of the aircraft and safely abort the operation if necessary.

In the case of Kansas State University (Exemption No. 13465A), the FAA considered whether to require the instructor/trainer to hold an-FAA issued flight instructor certificate. However, the agency previously determined that risk posed by UAS operations under FAA exemptions is mitigated in part by demonstration of aeronautical knowledge through a pilot certificate and UAS specific training rather than flight hours in a manned aircraft. *See* Exemption Nos. 11062 to Astraeus Aerial, 11213 to Aeryon Labs. Moreover, a certificated flight instructor would not have a basis for evaluating a student's proficiency as the FAA has not established UAS flight training standards. Accordingly, the FAA has determined that given the similarity between FSU's operation to that of KSU in Exemption No. 13465A, an FSU PIC qualified under this exemption has the requisite knowledge to ensure that instructional operations are conducted safely.

When conducting training, the PIC is responsible for conducting safe operations and for meeting all applicable conditions and limitations as prescribed in this exemption and ATO-issued COA, and operating in accordance with the operating documents. All training operations must be conducted during dedicated training sessions and trainers may receive compensation under this exemption. The petitioner may not conduct operations during training sessions for any purpose other than training. In accordance with the conditions and

limitations, the training operation must be conducted with a dedicated VO. The visual observer's responsibility is to maintain constant visual contact with the unmanned aircraft to be able to advise the PIC if other aircraft or unexpected people or objects have entered the operational area. Given the nature of this task, the VO must be dedicated only to visual observer responsibilities. Students receiving instruction or observing an operation may not serve as visual observers. A student who is focused on learning the UAS operation would not be able to focus on VO duties as well because that would increase the risk of the operation.

Regarding the petitioner's requested relief from 14 CFR § 91.109 *Flight instruction; Simulated instrument flight and certain flight tests,* the petitioner describes training scenarios in which a dual set of controls will be utilized. Similarly to Kansas State University in Exemption No. 13465A, the petitioner proposed using dual controls specifically a "buddy box" system using two transmitters, with one being operated by the student and the PIC having a secondary transmitter with full override capability. The FAA finds that the PIC must have sufficient override capability to immediately take direct control of the aircraft and safely abort the operation if necessary such as through proposed mitigations above. As in Exemption No. 13465A, the capability to safely abort the operation provides that safety will not be adversely affected even if the UAS does not have a dual set of controls. Therefore, the FAA is granting relief from 14 CFR § 91.109(a) subject to the applicable conditions and limitations stated below.

UAS Operating Parameters

The petitioner has requested relief from 14 CFR § 91.7(a) and (b), *Civil aircraft airworthiness*. While the petitioner's UAS will not require an airworthiness certificate, the FAA has determined that for the purposes of this exemption the pilot may determine the aircraft is in an airworthy condition prior to flight. The FAA's regulations state that the PIC of a civil aircraft is responsible for determining whether the aircraft is in a condition for safe flight. Therefore, relief from § 91.7(a) is granted and relief from § 91.7(b) is not necessary.

The petitioner requested relief from 14 CFR § 91.9(b)(2) *Civil aircraft flight manual, marking, and placard requirements* and § 91.203(a) and (b) *Civil aircraft: Certifications required.* The FAA has previously determined that relief from these sections is not necessary. *See* Exemption No. 11213. Relevant materials may be kept in a location accessible to the PIC in compliance with the regulations.

The petitioner has requested relief from 14 CFR § 91.119 (b) and (c), *Minimum safe altitudes*. In previous exemptions, the FAA classified UAS operations as closed-set motion picture and television filming operations or aerial data collection. S*ee* Exemption No. 11213. Due to the

close proximity to persons, only closed-set filming operations were required to have a Motion Picture and Television Operations Manual (MPTOM) in accordance with their exemption. Aerial data collection and any operation not classified as closed-set filming were not required to have an MPTOM or similar manual because their operations were not conducted within close proximity to people unless adequate barriers were provided.

Operations Near People

For the reasons discussed below, the FAA finds that FSU may allow a small unmanned aircraft to fly closer than 500 feet to a student who is part of a flight training class. FSU may also allow the small unmanned aircraft to fly directly over the student manipulating the flight controls of the small UAS and people who are directly participating in the flight operation, such as the PIC and the visual observer.

In its petition for exemption, FSU proposed to operate the small unmanned aircraft in a sterile environment maintained according to the standard FSU operating procedure and at speeds less than 50 knots (57 miles per hour) during training operations. The FAA finds that consistent with Exemption No. 13465; operating small unmanned aircraft at speeds not exceeding 87 knots (100 MPH) does not adversely affect safety. FSU's proposed operations include the use of a "buddy box" system. Buddy box systems utilize two transmitters, one as the instructor controller and the other as the student controller. The transmitter of the student (trainer transmitter or buddy box) will be connected by a trainer cable to another transmitter (master transmitter) controlled by the PIC instructor. The PIC instructor will be able to control the UAS with his or her transmitter then flip a switch to turn control over to the student and flip the switch again to reclaim control at any time. In this way, the PIC instructor will be able to easily demonstrate how to fly the UAS or rescue the UAS if the student makes a poor aeronautical decision without passing the same transmitter back and forth (which could result in delays and crashes). The FAA finds that a buddy box system is one way to ensure that the PIC maintains control of the operation. However, there may be other methods or procedures that could ultimately achieve an equivalent level of safety in a training environment. Therefore, in accordance with the conditions and limitations below,the petitioner must employ a method that ensures the PIC maintains sufficient override capability to immediately take direct control of the small UAS and safely abort the operation if necessary. Such actions may include taking any action necessary to ensure safety of other aircraft as well as persons and property on the ground in the event of unsafe maneuversor emergencies, for example landing in an empty area away from people and property.

The FAA finds that the petitioner's operation is similar in all aspects to that of KSU in Exemption No. 13465A. Therefore, the FAA finds a small unmanned aircraft flying closer

than 500 feet or over the student or people who are directly participating in the flight operation, such as the PIC and the visual observer, will not adversely affect safety. Finally, the FAA finds that FSU operating a small unmanned aircraft closer than 500 feet but not directly over a student who is part of the training class, but is not manipulating the flight controls of the small UAS, will not adversely affect safety.

With the exception of the people directly participating in the flight operation of a small UAS or students who are part of the flight training class, a UA may only be operated within 500 feet of a person when barriers or structures are present that sufficiently protect that person from the UA and/or debris or hazardous materials such as fuel or chemicals in the event of an accident. Under these conditions, the operator must ensure that nonparticipating persons remain under such protection for the duration of the operation. 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 that does not cause undue hazard to persons.

Additionally, operations for training, proficiency, or experience building for PICs to qualify to operate under this exemption may not be conducted within 500 feet of nonparticipating persons to ensure the safety of others.

A small UA may be flown over or near people subject to the conditions and limitations below.

All people associated with the operations must be briefed by the PIC on the potential risk of the proposed flight operation(s) and acknowledge and consent to those risks. The FAA routinely uses briefings as a means to notify passengers and others of safety information and to risks of certain operations. *See, e.g.*, 14 CFR §§ 91.319(d)(1) (advising passengers of experimental nature of an aircraft); 136.7 (air tour briefings). The requirement to obtain consent provides an additional margin of safety by building upon the briefing requirement to ensure that participants have acknowledged that a UA will be operated within 500 feet. The consent requirement is consistent with exemptions authorizing UAS closed-set filmmaking. *See* Exemption No. 11062.

Additionally FSU will be required to maintain an operations manual. In Exemption No. 11062 (Astraeus Aerial), the FAA granted exemption to the part 91 minimum safe altitude rules consistent with the relief typically provided to manned operations in FAA Order 8900.1 V3, C8, S1, *Issue a Certificate of Waiver for Motion Picture and Television Filming*. The order allows UA to be operated within 500 feet of participating persons, vehicles, and structures directly involved in the performance of the actual filming. That exemption required the operator to have an approved Motion Picture and Television Operations Manual (MPTOM). Based on existing motion picture filming practice, Exemption No. 11062 established the

requirement that UAS operations must comply with the petitioner's MPTOM when conducting closed-set filming operations.

Additionally, the FAA recognizes that there are additional risks when operating a UA close to people, whether for the purpose of closed-set filming or otherwise. As such the FAA has determined that when conducting these types of operations, the operator must have an operations manual addressing the items as specified in the conditions and limitations below. Regardless of the operation type (closed set film-making or other operation types), the operations manual requirement helps ensure that safety will not be adversely affected because the operator must document and address operational safety practices relevant to its operation. An operations manual must include items such as; the operator's contact information, distribution and revision information, persons authorized, plan of activities, permission to operate, security methodology, briefing instructions, essential flight personnel minimum requirements, communications information, and accident notification plan. Documented operational safety practices and procedures help ensure a safe and repeatable process for conducting flight operations. Formal procedures ensure adequate safety guidelines are available and adhered to in normal operational environments, but also during emergency circumstances. The operations manual is considered part of the operating documents and must be accessible to the PIC during operations. This operations manual is based on the requirement in previous exemptions for a MPTOM for closed-set filming.

Operators conducting these operations must also submit a written Plan of Activities to the local Flight Standards District Office at least 72 hours prior to initiating operations as described in the conditions and limitations below. The written plan of activities includes pertinent items provided to Flight Standards District Offices. The written plan of activities is necessary for Aviation Safety Inspectors to conduct surveillance of activities and ensure compliance with the provisions of the authorization and waiver, associated special provisions, operations manual, and the plan of activities in accordance with FSIMS 8900.1 to ensure the safety of the NAS.

Operations Near Vessels, Vehicles, and Structures

Operations near vessels, vehicles, and structures are those operations in which a UA is operated within 500 feet of such objects. To conduct such operations, the PIC must: (1) have permission from a person with legal authority over any vessels, vehicles or structures located within 500 feet of the UA's operating area; and (2) make a safety assessment of the risk of operating closer to those objects and determine that no undue hazard would result from the operation.

The FAA is granting relief from §§ 91.119(c) and 91.151(a) consistent with relief granted in Exemption No. 11062 to Astraeus Aerial.

Public Interest

The FAA finds that a grant of exemption is in the public interest. Professional training programs for UAS operators will positively affect unmanned aviation activities by providing future UAS operators with a safe environment to gain proficiency and experience. This gives the FAA good cause to find that the UAS operation enabled by this exemption is in the public interest.

The following table summarizes the FAA's determinations regarding the relief sought by the petitioner:

Relief considered (14 CFR)	**FAA determination (14 CFR)**
Part 21	Relief not necessary
45.23(b)	Relief not necessary
61.23(a) and (c)	Relief granted with conditions and limitations
61.101(e)(4) and (5)	Relief granted with conditions and limitations
61.113(a)	Relief granted with conditions and limitations
61.133	Relief not necessary
61.3(d)(2)(iii)	Relief not necessary
61.315(a)	Relief granted with conditions and limitations
91.7(a)	Relief granted with conditions and limitations
91.7(b)	Relief not necessary
91.9(b)(2)	Relief not necessary
91.9(c)	Relief not granted
91.103	Relief not granted
91.109(a)	Relief granted with conditions and limitations
91.119(a)	Relief not granted

Relief considered (14 CFR)	FAA determination (14 CFR)
91.119(b)	Relief not granted
91.119(c)	Relief granted with conditions and limitations
91.119(d)	Relief not necessary
91.121	Relief granted with conditions and limitations
91.151(a)(1)	Relief granted with conditions and limitations
91.203(a) and (b)	Relief not necessary
91.405(a)	Relief granted with conditions and limitations
91.407(a)(1)	Relief granted with conditions and limitations
91.409(a)(1) and (2)	Relief granted with conditions and limitations
91.417(a) and (b)	Relief granted with conditions and limitations

The FAA's 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, Florida State University 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), 91.109(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 conduct UAS operations according to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption**,** Florida State University is hereafter referred to as the operator.

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

1. The operator is authorized by this grant of exemption to use any aircraft identified on the List of Approved Unmanned Aircraft Systems (UAS) under Section 333 at regulatory docket FAA–2007–3330 at www.regulations.gov, when weighing less than 55 pounds including payload. Proposed operations of any aircraft not on the list currently posted to the above docket will require a new petition or a petition to amend this exemption.

2. If operations under this exemption involve the use of foreign civil aircraft[5] the operator would need to obtain a Foreign Aircraft Permit pursuant to 14 CFR § 375.41 before conducting any commercial air operations under this authority. Application instructions are specified in 14 CFR §375.43. Applications should be submitted by electronic mail to the DOT Office of International Aviation, Foreign Air Carrier Licensing Division. Additional information can be obtained via https://cms.dot.gov/policy/aviation-policy/licensing/foreign-carriers.

3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The operator 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. This limitation is in addition to any altitude restrictions that may be included in the applicable COA.

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

6. The PIC must have the capability to maintain visual line of sight (VLOS) 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 that individual's FAA-issued airman medical certificate or valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal Government, to see the UA.

7. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the VO at all times. The VO must use human vision unaided by any device other than corrective lenses to see the UA. The VO, the person manipulating the flight controls of the small UAS, and the 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

[5] *Foreign civil aircraft* means (a) an aircraft of foreign registry that is not part of the armed forces of a foreign nation, or (b) a U.S.-registered aircraft owned, controlled or operated by persons who are not citizens or permanent residents of the United States. 14 CFR §375.1.

the VO can perform the duties required of the VO. Students receiving instruction or observing an operation as part of their instruction may not serve as visual observers.

8. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this 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, the applicable ATO-issued COA, and the procedures outlined in the operating documents, the most restrictive conditions, limitations, or procedures apply and must be followed. The operator may update or revise its operating documents as necessary. The operator is responsible for tracking revisions and presenting 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 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 exemption. The FAA's UAS Integration Office may be contacted if questions arise regarding updates or revisions to the operating documents.

9. 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 essential flight personnel only and must remain at least 500 feet from all 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.

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

11. 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.

12. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.

13. *PIC certification:* Under this 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. *PIC qualifications:* The PIC must demonstrate the ability to safely operate the UAS in a manner consistent with how it will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures before conducting student training operations. Flights for the pilot's own training, proficiency, or experience-building funder this exemption may be conducted under this exemption. PIC qualification flight hours and currency may be logged in a manner consistent with 14 CFR § 61.51(b), however UAS pilots must not log this time in the same columns or categories as time accrued during manned flight. UAS flight time must not be recorded as part of total time.

15. *Training:* The operator may conduct training operations when the trainer/instructor is qualified as a PIC under this exemption and designated as PIC for the entire duration of the flight operation. Students/trainees are considered direct participants in the flight operation when manipulating the flight controls of a small UAS and are not required to hold any airman certificate. The student/trainees may be the manipulators of the controls; however, the PIC must directly supervise their conduct and the PIC must also have sufficient override capability to immediately take direct control of the small UAS and safely abort the operation if necessary, including taking any action necessary to ensure safety of other aircraft as well as persons and property on the ground in the event of unsafe maneuvers and/or emergencies for example landing in an empty area away from people and property.

16. Under all situations, the PIC is responsible for the safety of the operation. The PIC is also responsible for meeting all applicable conditions and limitations as prescribed in this exemption and ATO-issued COA, and operating in accordance with the operating documents. All training operations must be conducted during dedicated training sessions and may or may not be for compensation or hire. The operation must be

conducted with a dedicated VO who is no collateral duties and is not the PIC during the flight. The VO must maintain visual sight of the aircraft at all times during flight operations without distraction in accordance with the conditions and limitations below. Furthermore, the PIC must operate the UA not closer than 500 feet to any nonparticipating person without exception.

17. 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.

18. 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.

19. For tethered UAS operations, the tether line must have colored pennants or streamers attached at not more than 50 foot intervals beginning at 150 feet above the surface of the earth and visible from at least 1 mile. This requirement for pennants or streamers is not applicable when operating exclusively below the top of and within 250 feet of any structure, so long as the UA operation does not obscure the lighting of the structure.

20. For UAS operations where GPS signal is necessary to safely operate the UA, the PIC must immediately recover/land the UA upon loss of GPS signal.

21. If the PIC loses command or control link with the UA, the UA must follow a pre-determined route to either reestablish link or immediately recover or land.

22. The PIC must abort the flight operation if unpredicted circumstances or emergencies that could potentially degrade the safety of persons or property arise. The PIC must terminate flight operations without causing undue hazard to persons or property in the air or on the ground.

23. 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.

24. All aircraft operated in accordance with this exemption must be registered in accordance with 14 CFR part 47 or 48, and have identification markings in accordance with 14 CFR part 45, Subpart C or part 48

25. 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.

26. The UA must remain clear of and give way to all manned aircraft at all times.

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

28. All flight operations must be conducted at least 500 feet from all persons, vessels, vehicles, and structures unless when operating:
    a. *Over or near people directly participating in the operation of the UAS.* People directly participating in the operation of the UAS include the student manipulating the controls, PIC, VO, and other consenting personnel that are directly participating in the safe operation of the UA.
    b. *Near but not over people directly participating in the intended purpose of the UAS operation.* People directly participating in the intended purpose of the UAS includes students in a class (not manipulating the controls), who must be briefed on the potential risks and acknowledge and consent to those risks. Operators must notify the local Flight Standards District Office (FSDO) with a plan of activities at least 72 hours prior to flight operations.
    c. *Near nonparticipating persons:* Except as provided in subsections (a) and (b) of this section, a UA may only be operated closer than 500 feet to a person when barriers or structures are present that sufficiently protect that person from the UA and/or debris or hazardous materials such as fuel or chemicals in the event of an accident. Under these conditions, the operator must ensure that the person remains under such protection for the duration of the operation. If a situation arises where the person leaves such protection and is within 500 feet of the UA, flight operations must cease immediately in a manner that does not cause undue hazard to persons.
    d. *Near vessels, vehicles, and structures.* Prior to conducting operations the operator must obtain permission from a person with the legal authority over any vessels, vehicles or structures that will be within 500 feet of the UA during operations. The PIC must make a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

29. All operations shall be conducted over private or controlled-access property with permission from a person with legal authority to grant access. Permission will be obtained for each flight to be conducted.

30. 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 within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) in accordance with its UAS accident reporting requirements.

For operations conducted closer than 500 feet to people directly participating in the intended purpose of the operation, not protected by barriers, the following additional conditions and limitations apply:

31. The operator must have an operations manual that contains at least the following items, although it is not restricted to these items.
    a. Operator name, address, and telephone number.
    b. Distribution and Revision. Procedures for revising and distributing the operations manual to ensure that it is kept current. Revisions must comply with the applicable conditions and limitations in this exemption.
    c. Persons Authorized. Specify criteria for designating individuals as directly participating in the safe operation of the UAS. The operations manual must include procedures to ensure that all operations are conducted at distances from persons in accordance with the conditions and limitations of the exemption.
    d. Plan of Activities. The operations manual must include procedures for the submission of a written plan of activities.
    e. Permission to Operate. The operations manual shall specify requirements and procedures that the operator will use to obtain permission to operate over property or near vessels, vehicles, and structures in accordance with this exemption.
    f. Security. The manual must specify the method of security that will be used to ensure the safety of nonparticipating persons. This should also include procedures that will be used to stop activities when unauthorized persons, vehicles, or aircraft enter the operations area, or for any other reason, in the interest of safety.
    g. Briefing of persons directly participating in the intended operation. Procedures must be included to brief personnel and participating persons on the risks involved, emergency procedures, and safeguards to be followed during the operation.
    h. Personnel directly participating in the safe operation of the UAS Minimum Requirements. In accordance with this exemption, the operator must specify the minimum requirements for all light personnel in the operating manual. The PIC at

a minimum will be required to meet the certification standards specified in this exemption.

i. Communications. The operations manual must contain procedures to provide communications capability with participants during the operation. The operator can use oral, visual, or radio communications as along as the participants are apprised of the current status of the operation.
j. Accident Notification. The operations manual must contain procedures for notification and reporting of accidents in accordance with this exemption.

In accordance with this exemption, the operating manual and all other operating documents must be accessible to the PIC during UAS operations.

32. At least 72 hours prior to operations, the operator must submit a written Plan of Activities to the local Flight Standards District Office having jurisdiction over the proposed operating area.

    The Plan of Activities must include at least the following:
    a. Dates and times for all flights. For seasonal or long-term operations, this can include the beginning and end dates of the timeframe, the approximate frequency (e.g. daily, every weekend, etc.), and what times of the day operations will occur. A new plan of activities must be submitted prior to each season or period of operations.
    b. Name and phone number of the on-site person responsible for the operation.
    c. Make, model, and serial or registration number of each UAS to be used.
    d. Name and certificate number of each UAS PIC involved in the operations.
    e. A statement that the operator has obtained permission from property owners. Upon request, the operator will make available a list of those who gave permission.
    f. Signature of exemption holder or representative stating the plan is accurate.
    g. A description of the flight activity, including maps or diagrams of the area over which operations will be conducted and the altitudes essential to accomplish the operation.

Unless otherwise specified in this 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, 48, 61, and 91.

This exemption terminates on August 31, 2018, unless sooner superseded or rescinded.

Issued in Washington, DC, on August 15, 2016.

/s/
John Barbagallo
Deputy Director, Flight Standards Service

Enclosure