

Exemption No. 11213

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

In the matter of the petition of

AERYON LABS, INC.

for an exemption from part 21, and
§§ 45.23(b), 61.113(a) and (b), 61.133(a),
91.7(a), 91.9(b)(2) and (c), 91.103, 91.109(a),
91.119, 91.151(a), 91.203(a) and (b),
91.405(a), 91.407(a)(1), 91.409(a)(2), and
91.417(a) of Title 14, Code of Federal
Regulations

Regulatory Docket No. FAA-2014-0642

GRANT OF EXEMPTION

By letters dated August 25, 2014 and February 5, 2015, Mr. Dave Kroetsch, Aeryon Labs, Inc. (hereinafter petitioner or operator), 575 Kumpf Drive, Waterloo, Ontario, Canada N2V, petitioned the Federal Aviation Administration (FAA) for an exemption from part 21, and §§ 45.23(b), 61.113(a) and (b), 61.133(a), 91.7(a), 91.9(b)(2) and (c), 91.103, 91.109(a), 91.119, 91.151(a), 91.203(a) and (b), 91.405(a), 91.407(a)(1), 91.409(a)(2), and 91.417(a) of Title 14 Code of Federal Regulations (14 CFR). The exemption would allow the petitioner to operate an unmanned aircraft system (UAS) to perform market research, aerial surveys, mapping, and inspections.

The petitioner supports its request with the following information:

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

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

- 1) SkyRanger Performance Characteristics, Pre-flight Inspection Checklist
- 2) Aeryon SkyRanger Training Program
- 3) Aeryon SkyRanger User Guide

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 September 30, 2014 (79 FR 58848). Five comments were received. Three commenters, including the Small UAV Coalition (Coalition), supported the petition. The Air Line Pilots Association, International (ALPA) and the National Agricultural Aviation Association (NAAA) opposed it.

In support of the petition, the Coalition stated the petitioner has proposed to abide by stronger safety measures than hobby and modeler groups operating similar aircraft. The Coalition stated that it does not believe that heightened safety measures should be required for the petitioner simply because of the commercial nature of its operations. The Coalition urged the FAA to adopt an evaluation framework for UAS operations under section 333 of Pub. L. 112–95 that weighs the relative safety issues and risks of UAS by class and operational circumstances, rather than adopting artificial distinctions among unmanned aerial vehicles based on commercial and noncommercial operations. The petitioner’s UAS pose considerably less safety risk than larger UAS. The Coalition asserted that because UAS operations like the petitioner’s pose minimal risk to safety, they should be subject to minimal and appropriate regulations.

The Coalition noted the FAA is to consider the seven factors¹ in section 333 as a minimum. The Coalition stated the petition shows the FAA should consider factors other than those specified in section 333, such as: location, the altitude of its small UAV operations, proven experience pursuant to Certificates of Authorization in the United States and similar approvals in Canada. The Coalition maintained that the petitioner’s proposed operations satisfy the seven factors in section 333 and include several additional mitigating factors to ensure the

¹ Section 333(b) of P.L. 112-95 states, in part: “In making the determination under subsection (a), the Secretary shall determine, at a minimum-- (1) which types of unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security;”

safety and security of the proposed UAS operations. The Coalition emphasized the FAA must evaluate each factor within the context of the petitioner's proposed UAS operations.

The Coalition also commented that the FAA should grant relief from the requirement to hold an airman's certificate. The Coalition further stated that if an airman certificate is required then, at a minimum, the FAA should provide an exception from the training and testing requirements in part 61 in favor of requirements pertinent to the aircraft and operation proposed. The Coalition also asserted that in section 333 Congress intended for the FAA to consider national security with respect to the operation as opposed to addressing it through pilot certification.

The FAA notes that, as discussed in the grant of exemption to Trimble Navigation Ltd. (Exemption No. 11110), neither section 333, nor the FAA's exemption authority² allows the FAA to exempt pilots from the statutory requirement to hold an airman certificate as prescribed in 49 USC § 44711.

The Coalition commented that a visual observer (VO) should not be required for all small UAS operations. The Coalition further asserted that the presence of one or more VOs may allow the UAS to be operated beyond visual line of sight (VLOS) of the pilot in command (PIC) and that the petitioner's proposal to operate the unmanned aircraft (UA) within VLOS of the PIC *and/or* VO should be permitted.

The FAA notes that one of the determinations for operations under section 333 is operation within visual line of sight. The PIC must maintain VLOS while operating the UA. The FAA finds that a VO complements the PIC's capability to see and avoid other aircraft, including when the PIC may be momentarily attending to other flying tasks. The VO provides an additional level of operational safety.

ALPA expressed concern regarding several aspects of the petition. ALPA noted that while the proposed operations will avoid congested or populated areas and operate under VLOS in Visual Meteorological Conditions (VMC), the petitioner did not provide detailed procedures for controlling the airspace or area of operation. Specifically, ALPA stated, "there must be means both to ensure that the sUAS remains within the Class G airspace under 400' AGL and to ensure that the hazard of other aircraft intruding on the operation is mitigated."

The FAA believes the limitations under which the petitioner will operate (i.e. VLOS and at or below 400 feet above ground level (AGL)) are sufficient mitigations to this risk so that the operations will not adversely affect safety.

² 49 USC § 44701(f)

ALPA noted that the petitioner does not state how the pilot and the observer will be able to communicate with each other. ALPA stated that text messaging, either by mobile phone or other means, could have unknown latencies and extend to several minutes. NAAA stated UAS observers must be present and able to communicate with the operator from the most minimal distance possible. The conditions and limitations regarding PIC and VO communications address those concerns.

ALPA asserted the UA's lithium polymer batteries have numerous associated fire and explosion hazards as outlined in DOT/FAA/AR-09/55, "Flammability Assessment of Lithium-Ion and Lithium-Ion Polymer Battery Cell Designed for Aircraft Power Usage (January 2010)," and that the safe carriage of the batteries and the mitigations in place for known risks should be addressed. The referenced study was primarily conducted to determine how certain battery cells react in a fire situation aboard manned airplanes. Given the size of the battery and the operating conditions of the UAS, the FAA concludes that the use of a lithium polymer battery will not pose an undue safety risk for the proposed operations.

ALPA commented that while the petitioner's aircraft has a barometric sensor, the platform does not have a barometric altimeter as required by 14 CFR § 91.121. ALPA stated that processes or mitigations must be in place to ensure the UA can accurately maintain altitude including engineering processes, software development and control, electronic hardware development and control, configuration management, and design assurance to ensure the aircraft and its control system(s) operate to the same level of safety as other aircraft operated commercially in the National Airspace System (NAS).

ALPA commented that command and control (C2) link failures are one of the most common failures on a UAS, and that lost link mitigations should require safe modes to prevent fly-aways or other scenarios. The FAA has inserted conditions and limitations in this exemption to mitigate the risk associated with such failures.

ALPA also noted that the petitioner's proposed operations are for "compensation or hire," and therefore contends the pilot must hold at least a current FAA commercial pilot certificate with an appropriate category and class rating for the type of aircraft being flown, as well as specific and adequate training on the UAS make and model intended to be used. Similarly, ALPA asserted a current second-class airman medical certificate should be required. NAAA also commented on pilot qualification, stating—

Just as manned aircraft pilots are required to undergo a rigorous training curriculum and show that they are fit to operate a commercial aircraft, so too must UAS operators. Holding a commercial certificate holds UAS operators to similar high standards as

commercial aircraft operators and ensures they are aware of their responsibilities as commercial operators within the NAS. Medical requirements ensure they have the necessary visual and mental acuity to operate a commercial aircraft repeatedly over a sustained period of time.

The FAA has reviewed the knowledge and training requirements of sport, recreational, private and commercial certificates and concluded that a UAS PIC holding a minimum of a sport pilot certificate, and operating under this exemption, would not adversely affect operations in the NAS or present a hazard to persons or property on the ground. Additional discussion of the FAA's review is found in the FAA's Analysis section of this exemption.

ALPA noted the petitioner must specify a means to meet see and avoid requirements in § 91.113 given the absence of an onboard pilot. The FAA notes that all flights must be operated within VLOS of the PIC and VO.

ALPA also expressed concern that the petition makes no reference to compliance with, or a request for waiver from, 14 CFR 61.195, *Flight instructor limitations and qualifications*, which defines the requirements for flight instructors. A certificated flight instructor is authorized to provide the instruction required for the certificates or ratings or currency listed in 14 CFR § 61.193. A person instructing on how to operate the UAS under the petitioner's training program would not need to be a certificated flight instructor because the instruction is not being provided for a certificate or rating listed in § 61.193. We note that none of the UAS operations proposed by the petitioner require such flight instruction because § 61.31(l) allows for operation of the UAS by an airman who is current per 14 CFR § 61.56 without a category and class rating. Instruction provided toward obtaining the pilot certificate required by this exemption would need to be provided by a certificated flight instructor.

ALPA opposed the petitioners request to avoid providing aircraft documentation (critical for aircraft maintenance tracking, AD issuance, related performance information) of its small UAS. The FAA has previously determined in Grant of Exemption 11062, *Astraeus Aerial*, that relief from these sections is not necessary. Relevant materials may be kept in a location accessible to the PIC in compliance with the regulations.

ALPA opposed the petitioner's request for an exemption from the aircraft maintenance and record keeping requirements. ALPA asserted that the petitioner's small UAS "should comply to the same level of safety as other aircraft operated commercially in the NAS." The FAA finds that adherence to the petitioner's operating documents, as required by the conditions and limitations below, is sufficient to ensure that safety is not adversely affected.

ALPA also expressed concern that the petitioner's request is not for a single specific operation or location, but for all operations of the same general type. ALPA stated that this results in a considerable increase in the FAA's oversight tasks. The FAA notes ALPA's concern and in order to minimize potential impact to the NAS, the FAA requires that each operator secure a Certificate of Waiver or Authorization (COA) which covers specific details of the petitioner's operation. The FAA recognizes that UAS integration will generate new NAS access demand and will review and adjust accordingly.

NAAA noted that its members operate in low-level airspace, and therefore clear low-level airspace is vital to the safety of these operators. NAAA stated that seeing and avoiding other aircraft and hazardous obstructions is the backbone for agricultural safety, and that agricultural pilots depend on pilots of other aircraft to perform their see-and-avoid functions to prevent collisions. NAAA believes UAS operations at low altitudes will increase the potential for collision with agricultural aircraft.

The FAA recognizes these concerns and has incorporated associated conditions and limitations into this exemption, including: (a) a Notice to Airmen (NOTAM) issued for all operations; (b) operations conducted within VLOS of the pilot in command (PIC) and the VO; and (c) the UAS PIC must always yield right-of-way to manned aircraft.

NAAA stated that FAA airworthiness certification should be a requirement for all unmanned aircraft to operate within the NAS. NAAA recommended UAS be equipped with ADS-B or similar identification and positioning systems, strobe lights, high-visibility markings and registration numbers. NAAA also recommended UAS be operated strictly within the line-of-sight of the ground controller, with the assistance of a VO and clear of any low-flying manned aircraft.

As discussed in greater detail below, Section 333 of the FAA Modernization and Reform Act of 2012 authorizes the Secretary of Transportation to determine, considering a number of factors laid out in the statute, that an airworthiness certificate is not necessary for certain operations. The Secretary has made that determination in this case and therefore the aircraft operated by the petitioner will not need to be certificated by the FAA.

The FAA's analysis is as follows:

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

Unmanned Aircraft System (UAS)

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 P.L. 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 its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, and any associated noise certification and testing requirements of part 36, are not necessary.

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 part 47, and have identification (N-Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable per § 45.29(f).³

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)(2) *Inspections*, and 91.417(a) *Maintenance records*. The FAA has determined that relief from § 91.409(a)(1) and § 91.417(b) is also necessary. The FAA has evaluated the petitioner's request and determined that adherence to the conditions and limitations below regarding the responsibilities for maintaining, inspecting, and pre-flight inspection are sufficient to ensure that safety will not be adversely affected. 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.

UAS Pilot in Command (PIC)

The petitioner proposed that its pilots would be able to operate safely because they would: (1) have successfully completed, at a minimum, FAA private pilot ground instruction and passed the FAA Private Pilot written examination or FAA-recognized equivalents including ICAO issued commercial, private license and ground school, and (2) have completed Aeryon's training program for operation of their UAS. The petitioner did not propose using pilots holding an FAA-issued pilot certificate.

³ An exemption from 14 CFR § 45.27 would not be necessary because of the allowance in § 45.29(f).

This section addresses the pilot certificate a person must hold to operate a UAS under this exemption, and the medical certificate a person must hold to operate a UAS under this exemption.

I. Pilot Certificate Required

Section 333 allows the Secretary of Transportation to make a determination regarding whether an airworthiness certificate is required for certain unmanned aircraft. However, it does not provide similar relief from the statutory requirement to hold an airman's certificate. *See* 49 U.S.C. § 44711(a). The FAA does not possess the authority to exempt the petitioner from the statutory requirement to hold an airman certificate. *See* Exemption No. 11110 (Trimble Navigation, Ltd.).

Given the above, the FAA must determine the appropriate level of pilot certification for the petitioner's proposed operations. In previous exemptions, the FAA found that a person holding a private pilot certificate would have the requisite aeronautical knowledge to operate a UAS safely under the terms of those exemptions.⁴ A private pilot certificate holder would also be subject to security screening by the Department of Homeland Security (DHS).

Because the petitioner did not propose to use certificated pilots, and in light of comments received, the FAA re-assessed the level of pilot certificate that would be appropriate for the petitioner's operations. In evaluating this petition, similar to the evaluation of the private and commercial pilot certificates in Exemption No. 11062, the agency compared the aeronautical knowledge requirements of the recreational and sport pilot certificates to those of the private pilot certificate. We found that the aeronautical knowledge requirements that would be applicable to a UAS operation under this exemption for a recreational pilot and sport pilot certificate are substantially similar as those for a private pilot certificate.

Additionally, similar to the private and commercial pilot certificates, holders of recreational and sport pilot certificates are subject to security screening by the Department of Homeland Security (DHS).

Therefore, because they must demonstrate aeronautical knowledge relevant to UAS operations and are subject to DHS screening, factors that were considered by the FAA in allowing private pilot operations under previous exemptions, the FAA now determines that

⁴ In Exemption No. 11062, for example, the FAA determined that a private pilot would have sufficient aeronautical knowledge to operate a UAS under that exemption. As discussed in that exemption, the FAA reached that determination after comparing the aeronautical knowledge requirements of the commercial and private pilot certificates. Without an exemption, these operations would have required a commercial pilot certificate.

holders of recreational and sport pilot certificates may serve as the PIC for UAS operations under this exemption.

Risk is also mitigated through conditions and limitations regarding PIC training. The petitioner may not permit any PIC to operate unless, through the petitioner's training and currency requirements, the PIC is able 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 people, vessels, vehicles and structures.

Accordingly, the FAA grants relief from §§ 61.101(e)(4) and (5), and 61.113(a), to allow a PIC holding a recreational or private pilot certificate to operate a UAS for compensation and hire, subject to the conditions and limitations below.⁵ The FAA is also granting relief from § 61.315(a) to permit the holder of a sport pilot certificate to act as the PIC of UAS operated under this exemption.

The petitioner requested relief from 14 CFR § 61.133. However, since § 61.133 already permits a commercial pilot to act as a PIC of an aircraft for compensation or hire, relief is not necessary.

II. Medical Certificate Required

The FAA also evaluated the medical certificate required to operate under this exemption. In previous exemptions, the FAA has permitted operations with second-class or third-class medical certificates, which traditionally correspond to operations conducted under commercial and private pilot certificates, respectively. As discussed above, the FAA determined that operations can safely be conducted under this exemption by recreational and sport pilot certificate holders. In light of this determination, the FAA also evaluated the medical certificate requirements appropriate for these operations.

The agency compared the sport pilot certificate holder privileges with the operations proposed by the petitioner. Sport pilot certificate holders may act as PIC of an LSA with either a medical certificate or U.S. issued driver's license.⁶ *See* 14 C.F.R. §§ 61.23(c), 61.315(a). LSA may weigh as much as 1,430 pounds and seat up to two persons, including the pilot. *See* 14 C.F.R. § 1.1. The FAA also considered that a PIC operating a lighter-than-air balloon or

⁵ Similar relief from 61.315(c)(2) and (3) is not necessary because these limitations on sport pilot certificate privileges only apply to LSA. The UAS being operated under this exemption are not LSA.

⁶ The FAA considers a U.S. driver's license to be any license to operate a motor vehicle issued by a state, the District of Colombia, Puerto Rico, a territory, a possession, or the Federal government. *See* 67 FR 5368.

glider requires neither an FAA issued medical certificate, nor a U.S. driver's license. *See* § 61.23(b)(3). Comparatively, under this exemption the UA weighs less than 55 pounds, is operated within visual line of sight of the PIC and below 400' AGL, and limited to operating with permission over private or controlled-access property.

The FAA finds that, because of the risk mitigations established in the conditions and limitations of this exemption, a person that holds a U.S. issued driver's license who is operating a UAS will not adversely affect safety. The FAA is granting relief from § 61.23(a) to allow any pilot that holds one of the pilot's certificates discussed above to operate a UAS under this exemption with a U.S. issued driver's license, in lieu of an FAA-issued medical certificate. The FAA is also granting relief from § 61.23(c) to allow sport pilot certificate holders to operate aircraft other than LSA with a U.S. issued driver's license under this exemption.

However, in absence of a defined regulatory structure specific to UAS, the FAA has determined the minimum requirement for a UAS PIC under this exemption is to possess at least a U.S. driver's license. A UAS PIC would also be able to operate under this exemption with an FAA-issued medical certificate.

The FAA also considered medical certificate requirements for a visual observer. As in Exemption No. 11062, 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 and 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.

III. Conclusion

In conclusion, the FAA finds that a PIC conducting operations under this grant of exemption may operate the UAS for compensation or hire, or in furtherance of a business, with any of the following pilot certificates: sport, recreational, private, commercial, or airline transport. Additionally, a PIC must hold and possess either a medical certificate issued under 14 CFR part 67 or a U.S. issued driver's license irrespective of the pilot certificate held. In addition, PICs must comply with 14 CFR § 61.53, *Prohibition on operations during medical deficiency*.

UAS Operating Parameters

The petitioner has requested relief from 14 CFR § 91.7(a), *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. 11062. Relevant materials may be kept in a location accessible to the PIC in compliance with the regulations.

The petitioner's requested relief from 14 CFR § 91.9(c) is not granted. As discussed earlier in this grant, the petitioner's UA must meet the requirements of part 45.

The petitioner requested relief from 14 CFR § 91.103 *Preflight Action*. The PIC will take all actions including reviewing weather, flight battery requirements, landings, and takeoff distances and aircraft performance data before initiation of flight. The FAA has imposed stricter requirements with regard to visibility and distance from clouds; this is to both keep the UA from departing the VLOS and to preclude the UA from operating so close to a cloud as to create a hazard to other aircraft operating in the NAS. The FAA also notes the risks associated with sun glare; the FAA believes that the PIC's and VO's ability to still see other air traffic, combined with the PIC's ability to initiate a return-to-home sequence, are sufficient mitigations in this respect. The PIC will also account for all relevant site-specific conditions in their preflight procedures. Therefore, the FAA is not granting relief from § 91.103.

While the petitioner requested relief from 14 CFR § 91.109 *Flight instruction; Simulated instrument flight and certain flight tests*, the petition did not describe training scenarios in which a dual set of controls would be utilized or required, i.e. dual flight instruction, provided by a flight instructor or other company-designated individual, which would require that individual to have fully functioning dual controls. The FAA is requiring that the petitioner's PICs possess at least a sport pilot certificate. This exemption will also require that training operations only be conducted during dedicated training sessions. As such, the FAA finds that the petitioner can conduct its operations without the requested relief from § 91.109.

Regarding the petitioner's requested relief from 14 CFR § 91.119, the FAA finds that:

- a. Relief from § 91.119(a), which requires operating at an altitude that allows a safe emergency landing if a power unit fails, is not granted. The FAA expects the petitioner to be able to perform an emergency landing without undue hazard to persons or property on the surface if a power unit fails.
- b. Relief from § 91.119(b), operation over congested areas, is not applicable, because this grant of exemption prohibits operations over congested or densely populated areas.
- c. Relief from § 91.119(c) is necessary because the aircraft will be operated at altitudes below 500 feet AGL. Section 91.119(c) states that no person may operate an aircraft below the following altitudes: *over other than congested areas*, an altitude of 500 feet above the surface, except over open water or sparsely populated areas. The FAA finds operations conducted in compliance with the conditions and limitations in this grant of exemption warrant relief from § 91.119(c).
- d. Relief from § 91.119(d) is not applicable.

The petitioner did not seek relief from 14 CFR § 91.121, *Altimeter settings*. When the UA is equipped with a barometric altimeter, relief from § 91.121 is not necessary. When the UA is not equipped with a barometric altimeter, an alternate means for measuring and reporting UA altitude is necessary, such as GPS. As stated in the conditions and limitations below, the FAA requires altitude be reported in feet AGL. The petitioner may choose to set the altitude indicator to zero feet AGL rather than local barometric pressure or field altitude before flight. Considering the limited altitude of the proposed operations, relief from 14 CFR § 91.121 is granted to the extent necessary to comply with the applicable conditions and limitations stated below.

Regarding petitioner's requested relief from 14 CFR § 91.151(a), *Fuel requirements for flight in VFR conditions*, prior UAS specific relief has been granted in Exemption Nos. 8811, 10808, and 10673 for daytime, Visual Flight Rules (VFR) conditions. The conditions and limitations below prohibit the PIC from beginning a UAS flight unless (considering wind and forecast weather conditions) there is enough available power for UAS to operate for the intended operational time and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater. The FAA finds that this provides sufficient reason to grant the relief from 14 CFR § 91.151(a)(1).

The FAA Air Traffic Organization (ATO) reviews all proposed UAS operations and evaluates the safety of these operations relative to the requested airspace through the existing Certificate of Waiver or Authorization (COA) process. The majority of current UAS operations occurring in the NAS are being coordinated through ATC by the issuance of a COA. This

process not only makes local ATC facilities aware of UAS operations, but also provides ATC the ability to consider airspace issues that are unique to UAS operations.

The FAA has issued a COA to this operator which is attached to this grant of exemption. This COA permits daytime VFR operations below 200 feet AGL beyond certain distances from airports. The COA requires the operator to request a NOTAM, which is the mechanism for alerting other users of the NAS to the UAS activities being conducted. The conditions and limitations below prescribe the requirement for the petitioner to follow the terms of a COA. If the petitioner intends to conduct operations outside of the parameters of what is permitted under the attached COA it may apply to the ATO for a new or amended COA.

Public Interest

The FAA finds that a grant of exemption is in the public interest. The enhanced safety and reduced environmental impact achieved using a 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.

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

Relief considered (14 CFR)	FAA determination (14 CFR)
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
61.315(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

Relief considered (14 CFR)	FAA determination (14 CFR)
91.103	Relief not granted
91.109	Relief not necessary
91.119(a)	Relief not granted
91.119(b) and (d)	Not applicable
91.119(c)	Relief granted with conditions and limitations
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, Aeryon Labs, Inc. 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 collection⁷. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption, Aeryon Labs, Inc. is hereafter referred to as the operator.

⁷ Aerial data collection includes any remote sensing and measuring by an instrument(s) aboard the UA. Examples include imagery (photography, video, infrared, etc.), electronic measurement (precision surveying, RF analysis, etc.), chemical measurement (particulate measurement, etc.), or any other gathering of data by instruments aboard the UA.

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 Aeryon SkyRanger 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 grant.
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 Colombia, Puerto Rico, a territory, a possession, or the Federal government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.
15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.
16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.
17. The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.
18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.
19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.

20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.
21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The exemption holder may apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.
22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N-Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.
23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.
24. The UA must remain clear and give way to all manned aviation operations and activities at all times.
25. The UAS may not be operated by the PIC from any moving device or vehicle.
26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
 - a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and,
 - b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

The PIC, VO, operator trainees or essential persons are not considered nonparticipating persons under this exemption.

27. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative. Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.
28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS-80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.nts.gov.

If this exemption permits 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 March 31, 2017, unless sooner superseded or rescinded.

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/s/

John S. Duncan,
Director, Flight Standards Service