Exemption No. 11208

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

In the matter of the petition of **SKY-FUTURES USA, INC.** for an exemption from parts 21; 43; 61; 67; §§ 45.11; 45.21; 45.22(d); 47.16; 91.9(b) and (c); 91.109; 91.119; 91.151; 91.203(a) and (b); 91.215, 91.319; 91.405; 91.407; 91.409; 91.413; and 91.417 of Title 14, Code of Federal Regulations	**Regulatory Docket No. FAA–2014-0641**

GRANT OF EXEMPTION

By letter dated August 25, 2014,[1] Mr. Jonathan Evans, CEO of SkyWard IO, Inc., 2333 Naito Parkway, Portland, Oregon 97204 and Mr. Chris Blackford, Global Operations Director of Sky-Futures USA, Inc. Inc., 100 Crescent Court, Suite 700, Dallas, Texas 75201 petitioned the Federal Aviation Administration (FAA) on behalf of Sky-Futures USA, Inc. (hereinafter petitioner or operator), for an exemption from parts 21, 43, 61, 67, §§ 45.11, 45.21, 45.22(d), 47.16, 91.9(b) and (c), 91.109, 91.119, 91.151, 91.203(a) and (b), 91.215, 91.319, 91.405, 91.407, 91.409, 91.413, and 91.417 of Title 14, Code of Federal Regulations (14 CFR). The exemption would allow the petitioner to operate the AscTec Falcon 8 unmanned aircraft system (UAS) to conduct oil and gas platform inspections on land and over water.

The petitioner supports its request with the following information:

See Appendix A for the petition submitted to the FAA describing the proposed operations, including the regulations that the petitioner seeks an exemption.

[1] By letter dated January 5, 2015, and posted to the public docket on January 6, the petitioner filed a supplement to its petition.

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

1. Sky-Futures UAV Operations Manual – Sky-Futures UK Operations v. 2.3.1
2. Sky-Futures UAV Operations Manual - Pilot Operators Manual 1 POM1/Part B
3. Sky-Futures UAV Operations Manual - Sky-Futures UK Operations Part C – Authorised Operations
4. Sky-Futures UAV Operations Manual - Operator Training Manual Part D
5. Sky-Futures UAV Operations Manual – UAV Maintenance and Servicing Part E

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 58853). Nine comments were received. Seven 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 Coalition suggested FAA safety regulations be proportionate to the risks posed by the particular proposed UAS operations by distinguishing between UAS. 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 factors[2] 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, pilot experience, and the 5,000 hours of experience in operating the UAV to conduct oil and gas platform inspection around the world. 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 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.

[2] 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; …"

The Coalition also commented that the FAA should grant relief from the requirement to hold an airman's certificate, but stated that at a minimum the FAA should provide an exception from part 61 and approve training and testing regiments that pertain to UAS commercial operations pertinent to the aircraft and operation proposed. The Coalition also asserted that Congress intended the section 333 national security criterion to focus on the operation rather than on the pilot and that shifting that focus imposes an unnecessary burden.

In response, as discussed in the grant of exemption to Trimble Navigation Ltd. (Exemption No. 11110), neither section 333 nor the FAA's authority to exempt from its regulations found in 49 USC § 44701(f), authorizes the FAA to provide exemption to the statutory requirement to hold an airman certificate as prescribed in 49 USC § 44711. The FAA does not agree that relying on the pilot certificate for a national security finding poses an unnecessary burden because pilots under this exemption, and the exemptions granted previously to section 333 requests, are already required to hold a pilot certificate to satisfy 49 USC § 44711.

The Coalition commented that a visual observer (VO) should not be required for all small UAS operation. 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. As the PIC is determined to be in command of the UA, he must maintain VLOS while operating the UA. The FAA also notes that a VO complements the PICs 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.

In support of the petition, individual commenters noted that the petitioner's proposed UAS operations would enhance safety and offer a lower cost and more flexible process for conducting oil and gas inspections.

ALPA expressed concern regarding several aspects of the petition. ALPA noted that while the proposed operations would take place over private and public property, the petitioner did not provide detail 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 defined airspace 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.

ALPA noted that the petition 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 an unknown latency that could 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 FAA has inserted a condition regarding PIC and VO communications.

ALPA asserted the UAS'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 mentioned the aircraft will not have a barometric altimeter as required by 14 CFR § 91.121, stating the ability to accurately maintain altitude must be addressed, and processes or mitigations, such as redundant control capability, fail-safe systems, backups and specific, validated procedures for system and equipment failures must be in place.

Regarding the fuel requirements of § 91.151, ALPA argues that using batteries as the only source of an aircraft's power is a substantial shift from traditional methods of propulsion, and requires further research to determine best safety practices. This comment is addressed in detail below.

ALPA stated that the petition seeks an exemption from the aircraft airworthiness process, 14 CFR 21 and 14 CFR § 91.203. The FAA discusses aspects of 14 CFR 21 with respect to the petitioner's request, below.

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 agrees and carefully examined the proposed operation to ensure that the vehicle design and the petitioner's operating documents addressed potential hazards related to C2 failure. The FAA finds that the UAS to be operated by the petitioner has sufficient design features to address these hazards. The FAA also finds that the operating documents have incorporated safety procedures to be followed by all operational participants should a C2 failure occur. Further detail is contained in the analysis of the UAS below.

ALPA also noted that the petitioner's proposed operations are for "compensation or hire," and argues 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 required by holders of both private and commercial certificates. Additional details are available in the ensuing analysis of this issue with regards to 14 CFR § 61.113.

ALPA stated that the petitioner did not specify requirements for flight instructors. As discussed below the FAA has found that the petitioner's training program and the condition requiring that the pilot have the skills after completing the training program to operate safely under this exemption will provide an acceptable level of preparation.

ALPA also expressed concern that the petitioner's waiver 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 National Airspace System (NAS), the FAA requires each operator secure a Certificate of Waiver or Authorization (COA) which covers specific details of the petitioners 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 (NOTAMs) 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 well 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) 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, Subpart H, *Airworthiness certificate*s. 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 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, Subpart H, and any associated noise certification and testing requirements of part 36 is not necessary.

Manned aircraft conducting aerial inspections can weigh thousands of pounds and are operated by an onboard pilot, in addition to other onboard crewmembers, as necessary. The petitioner's UA will weigh less than 5 lbs. with no onboard pilot or crew. The pilot and crew will be remotely located from the aircraft. The limited weight significantly reduces the potential for harm to participating and nonparticipating individuals or property in the event of an incident or accident. The risk to an onboard pilot and crew during an incident or accident is eliminated with the use of a UA for the intended operation.

Manned aircraft are at risk of fuel spillage and fire in the event of an incident or accident. The UA carries no fuel, and therefore the risk of fire following an incident or accident due to fuel spillage is eliminated.

This exemption does not require an electronic means to monitor and communicate with other aircraft, such as transponders or sense and avoid technology. Rather the FAA is mitigating the risk of these operations by placing limits on altitude, requiring enhanced stand-off distance from clouds, permitting daytime operations only, and requiring that the UA be operated within VLOS and yield right of way to all manned operations. Additionally, the operator will be required to request a NOTAM prior to operations to alert other users of the NAS.

The petitioner's UA has the capability to operate safely after experiencing certain in-flight failures. The UA is also able to respond to a lost-link event with a pre-coordinated, predictable, automated flight maneuver. The PIC has the ability to terminate the flight operation or initiate the automated return to home procedure outlined within the operating documents. These safety features provide an equivalent level of safety compared to a manned aircraft performing a similar operation and address ALPAs comment on mitigating risk of command and control link failures.

The petitioner requested relief from 14 CFR. part 45, *Identification and Registration Marking*. Additionally, petitioner requested relief from 14 CFR § 47.16, *Temporary registration*

numbers. However, consistent with prior grants of exemption for small UAS the FAA is requiring compliance with the registration and marking requirements of this part. *See* Exemption Nos. 11136, 11185.

Regarding the petitioner's requested relief from 14 CFR §§ 91.405, 91.407, 91.409, and 91.417, the FAA has determined relief from §§ 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* is necessary. The FAA has evaluated the petitioner's request and determined that cause for exemption to these requirements is warranted. The FAA notes that the petitioner's operating documents contain preflight and post flight checks, as well as scheduled maintenance in accordance with the manufacturer's instructions. Therefore, the FAA finds that adherence to the petitioner's operating documents and the conditions and limitations below, describing the requirements for maintenance, inspection, and recordkeeping, are sufficient to ensure that safety is not adversely affected. Accordingly, 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.

Additionally, the petitioner requested relief from 14 CFR part 43 *Maintenance, preventive maintenance, rebuilding, and alteration*. Relief from part 43 is not necessary because the UAS does not have a U.S. airworthiness certificate and is not foreign registered.

<u>UAS Pilot in Command (PIC)</u>

Regarding the petitioner's requested relief from 14 CFR part 61 *Certification: Pilots, Flight Instructors, and Ground Instructors*, the FAA finds that relief from § 61.113(a) *Private pilot privileges and limitations* is necessary for the petitioner to operate its UAS. Although Section 333 provides limited statutory flexibility relative to 49 USC § 44704 for the purposes of airworthiness certification, it does not provide flexibility relative to other sections of title 49. The FAA does not possess the authority to exempt from the statutory requirement to hold an airman certificate, as prescribed in 49 USC § 44711. For further information see Exemption No. 11110 (Trimble Navigation, Ltd).

The FAA is also requiring a pilot certificate for UAS operations because pilots holding an FAA issued private or commercial pilot certificate are subject to security screening by the Department of Homeland Security that certificated airmen undergo. As previously determined by the Secretary, the requirement to have an airman certificate ameliorates security concerns over civil UAS operations conducted in accordance with Section 333.

Given these grounds, the FAA must determine the appropriate level of pilot certification for the petitioner's proposed operation. Under current regulations, civil operations for compensation or hire require a PIC holding a commercial pilot certificate, per 14 CFR part 61. Based on the private pilot limitations, in accordance with pertinent parts of 14 CFR § 61.113(a), a pilot holding a private pilot certificate cannot act as a PIC of an aircraft for compensation or hire. However, in Grant of Exemption No. 11062 to Astraeus Aerial (Astraeus), the FAA determined that a PIC with a private pilot certificate operating the

Astraeus UAS would not adversely affect operations in the NAS or present a hazard to persons or property on the ground.

The petitioner proposes to operate with a pilot who does not possess any FAA issued pilot certificate. This is similar to other petitions for exemption previously filed with and considered by the FAA. As in Exemption Nos. 11109 (Clayco, Inc.) and 11170 (Viafield), the FAA has analyzed the petitioner's proposed operation and determined it does not differ significantly from these grants of exemption. The petitioner plans to operate in the NAS over controlled access property with the permission of the property owner/controller, while also limiting property access to consenting participants while operations are underway. Given: 1) the similar nature of the petitioner's proposed operating environment to that of Clayco and Viafield, 2) the parallel nature of private pilot aeronautical knowledge requirements to those of commercial requirements [ref: Exemption No. 11062, Astraeus Aerial], and 3) the airmanship skills necessary to operate in the UAS, the FAA finds that the additional manned airmanship experience of a commercially certificated pilot would not necessarily correlate to the airmanship skills required for the petitioner's proposed operations. Therefore, the FAA finds that a PIC holding a private pilot certificate and a third-class airman medical certificate is appropriate for the proposed operations.

With regard to the airmanship skills necessary to operate the UAS, the petitioner has proposed pilot qualification criteria and a training program. The conditions and limitations below stipulate that the petitioner may not permit any PIC to operate unless that PIC has completed the petitioner's training program, that 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 persons, vessels, vehicles and structures. The petitioner is responsible for assessing its operations and identifying any additional skills required to operate safely under normal and abnormal conditions. Normal condition skills may include the ability to maintain altitude, maintain visual line of sight (VLOS), and navigational skills. Abnormal condition skills may include the ability to avoid obstacles, avoid air traffic, and respond to loss of link.

In conclusion, the FAA finds that a PIC holding a current private pilot certificate and a third-class airman medical certificate, and who has completed the petitioner's flight training requirements, can conduct the proposed UAS operations without adversely affecting the safety of the NAS and persons or property on the ground. Upon consideration of the overall safety case presented by the petitioner and the concerns of the commenters, the FAA finds that granting the relief from 14 CFR § 61.113(a) is warranted. The FAA also finds that relief from 14 CFR § 61.113(b) is not necessary. Additionally, relief from 14 CFR § 61.133(a) is not necessary.

Regarding the petitioner's requested relief from 14 CFR part 67 *Medical standards and certification*, the FAA has determined that the petitioner must comply with the appropriate medical standards for a private airman certificate as described above. Therefore, relief from part 67 is not granted.

The petitioner has indicated it will supplement its proposed operation(s) with a UAV System Observer, but not a dedicated visual observer (VO). In Grant of Exemption No. 11062, the FAA agreed with the petitioner's proposed use of a VO and required a VO to be used in all UAS operations. 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. Moreover, the VO will not be operating the aircraft. Therefore, as in Grant of Exemption No. 11062, the FAA does not consider a medical certificate necessary for the VO and the requirement for a VO is included in the conditions and limitations below.

The FAA considers the PIC to be designated for the duration of the flight. Therefore, per the conditions and limitations below, the PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight.

UAS Operating Parameters

Although the petitioner did not request relief from 14 CFR § 91.7(a) *Civil aircraft airworthiness,* the FAA finds that relief from § 91.7(a) is necessary. While the petitioner's UAS will not require an airworthiness certificate in accordance with 14 CFR part 21, Subpart H, the FAA considers the petitioner's compliance with its operating documents to be a sufficient means for determining an airworthy condition. Therefore, relief from § 91.7(a) is granted. The petitioner is still required to ensure that its aircraft is in an airworthy condition – based on compliance with the operating documents prior to every flight, and as stated in the conditions and limitations below.

In accordance with 14 CFR § 91.7(b) *Civil aircraft airworthiness*, the PIC of the UAS is responsible for determining whether the aircraft is in a condition for safe flight. The FAA, as in grant of Exemption No. 11062 to Astraeus, has determined that the operating documents include procedures to be used prior to each flight that can ensure compliance with § 91.7(b). The petitioner is required to ensure that its aircraft is in a condition for safe flight – based on compliance with the operating documents– prior to every flight.

Regarding the petitioner's requested relief from 14 CFR § 91.9 (b) and (c), *Civil aircraft flight manual, marking, and placard requirements* and 14 CFR § 91.203(a) and (b) *Civil aircraft: Certifications required*, 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.

Regarding the petitioner's requested relief from 14 CFR § 91.109 *Flight instruction; Simulated instrument flight and certain flight tests,* the petitioner 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, that would require that individual to have fully functioning dual controls. Furthermore, the FAA is requiring that the petitioner's PICs possess at least a private pilot's certificate. Also, this

exemption will require that training operations only be conducted during dedicated training sessions. The FAA finds that safety will not be adversely impacted if the petitioner follows the training outlined in the operating documents. 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 *Minimum safe altitudes*, the petitioner did not specify the paragraph(s) in 14 CFR § 91.119 from which it requires relief. 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. Relief from § 91.119(b), operation over congested areas, is not applicable, because the petitioner states that operations will be conducted over sparsely populated areas. Relief from § 91.119(c) is necessary because the aircraft will be operated at altitudes below 400 feet above ground level (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. Section 91.119(c) provides that in operations over water or sparsely populated areas, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure. The petitioner states that it will operate pursuant to the following, self-imposed restrictions related to § 91.119:

- Petitioner will conduct operations over private or controlled access property with the permission of the landowner;
- Petitioner will conduct operations in Class G airspace, typically over water;
- Petitioner will avoid operations over populated areas and stay within the "sterile area";
- Petitioner will limit operations to Visual Flight Rules Meteorological Conditions (VMC) and daylight hours;
- Petitioner will ensure aircraft operations remain within VLOS of the PIC and VO and will be visually monitored at all times;
- Petitioner will operate no closer than 5nautical miles from an airport

The petitioner proposes to operate within 1640 feet (500 meters) laterally from the pilot and approximately 16 feet (5 meters) from any structures. As discussed in Exemption No. 11109 to Clayco, Inc. (*see* Docket No. FAA-2014-0507), operations conducted closer than 500 feet to the ground may require that the UA be operated closer than 500 feet to essential persons, or objects that would not be possible without additional relief. In open areas this requires the UA to remain 500 feet from all persons other than essential flight personnel (i.e. PIC, VO, operator trainees or essential persons). Therefore, the FAA is requiring that prior to conducting UAS operations, all persons not essential to flight operations (nonparticipating persons) must remain at appropriate distances.

The FAA has also considered that the UA will weigh about 5 pounds (2.2 kilograms). If barriers or structures are present that can sufficiently protect nonparticipating persons from the UA or debris in the event of an accident, then the UA may operate closer than 500 feet to persons afforded such protection. The operator must also 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. When considering how to immediately cease operations, the primary concern is the safety of those nonparticipating persons. In addition, the FAA finds that operations may be conducted closer than 500 feet to vessels, vehicles and structures when the property owner/controller grants such permission and the PIC makes a safety assessment of the risk of operating closer to those objects and determines that it does not present an undue hazard.
Operations closer than 500 feet to essential persons (i.e. PIC, VO, trainees, etc.) are permitted when operationally necessary. However at no time can operations be conducted so close to present an undue hazard to the essential persons per § 91.119(a).

Thus, the FAA finds that relief from § 91.119(c) is warranted provided adherence to the procedures in the operating documents and the FAA's additional conditions and limitations outlined below. Relief from § 91.119(a) is unwarranted as the FAA expects the petitioner to be able to perform an emergency landing without undue hazard to persons or property on the surface. Relief from §§ 91.119(b) and 91.119(d) are not applicable.

Regarding the petitioner's requested relief from § 91.151 *Fuel requirements for flight in VFR conditions*, prior relief has been granted for manned aircraft to operate at less than prescribed minimums, including Exemption Nos. 2689, 5745, and 10650. In addition, similar UAS-specific relief has been granted in Exemption Nos. 8811, 10808, and 10673 for daytime, VFR conditions. The petitioner's reference to this section is its commitment to land the UAS with a minimum of 5 minutes of battery power remaining. The operating documents include a detailed description of two separate battery warning levels provide warning levels for battery voltage of the flight system. These procedures provide the FAA with sufficient reason to grant the relief from§ 91.151(a) in accordance with the conditions and limitations below.

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 COA process. The majority of current UAS operations occurring in the NAS are being coordinated through Air Traffic Control (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 COA will require 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 obtain an ATO-issued COA.

While the petitioner requested relief from 14 CFR § 91.215 *ATC transponder and altitude reporting equipment and use*, the FAA is not granting relief because the petitioner is required to abide by the ATC COA referenced in the paragraph above.. Section 91.215(b)(3) includes provisions for aircraft not originally certificated with an engine-driven electrical system or which has not subsequently been certified with such a system installed. For UAS not equipped with a transponder, sub-paragraph (d)(3) authorizes requests for ATC authorized deviations made to the ATC facility having jurisdiction over the concerned airspace within the time

periods specified. For operation of an aircraft that is not equipped with a transponder, the request must be made at least one hour before the proposed operation. The FAA finds adherence to the conditions and limitations below, as well as compliance with the ATC-issued COA, will ensure safety. Therefore, relief from § 91.215 is not granted relief. Consequently, relief from § 91.413 *ATC transponder tests and inspections* is also not granted.

Public Interest

The FAA finds that a grant of exemption is in the public interest. The enhanced safety and reduced emissions achieved using a UAS 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)**
Part 21	Relief not necessary
Part 43	Relief not necessary
Part 45	Relief not granted
47.16	Relief not granted
61.113(a) and (b)	Relief granted from 61.113(a) with conditions and limitations; relief not necessary from 61.113(b)
61.133(a)	Relief not necessary
Part 67	Relief not granted
91.7(a)	Relief granted with conditions and limitations
91.9(b) and (c)	Relief not necessary
91.109	Relief not necessary
91.119	Relief not granted for paragraph (a); paragraph (b) relief not applicable; paragraph (c) relief granted with conditions and limitations; paragraph (d) relief not applicable
91.121	Relief granted with conditions and limitations
91.151	Relief granted for paragraph (a)(1), day, with conditions and limitations
91.203(a) and (b)	Relief not necessary
91.215	Relief not granted
91.319	Relief not applicable
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
91.413	Relief not granted
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, Sky-Futures USA, Inc. is granted an exemption from 14 CFR §§ 61.113(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), 91.417(a) and (b) to the extent necessary to allow the petitioner to operate a UAS to conduct oil and gas platform inspections. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

Relative to this grant of exemption, Sky-Futures USA, Inc. is hereafter referred to as the operator.

The petition and the following supporting documentation are hereinafter referred to as the operating documents:

1. Sky-Futures UAV Operations Manual – Sky-Futures UK Operations v. 2.3.1
2. Sky-Futures UAV Operations Manual - Pilot Operators Manual 1 POM1/Part B
3. Sky-Futures UAV Operations Manual - Sky-Futures UK Operations Part C – Authorised Operations
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5. Sky-Futures UAV Operations Manual – UAV Maintenance and Servicing Part E

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 following aircraft described in the operating documents which has four rotors in a quadrotor configuration weighing less than 5 pounds: AscTec Falcon 8 UAS. Proposed operations of any other aircraft will require a new petition or a petition to amend this grant.

2) UAS operations under this exemption are limited to conducting aerial inspection of controlled-access oil and gas facilities over land and water.

3) The UA may not be flown at an airspeed exceeding 29 knots (15m/s).

4) The UA must be operated at an altitude of no more than 400 feet above ground level (AGL), as indicated by the procedures specified in the operating documents. All altitudes reported to ATC must be in feet AGL.

5) The UA must be operated within visual line of sight (VLOS) of the pilot in command (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.

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 functions prescribed in the operating documents.

7) The VO must not perform any other duties beyond assisting the PIC with seeing and avoiding other air traffic and other ground based obstacles/obstructions and is not permitted to operate the camera or other instruments.

8) The operating documents and this grant of exemption 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 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.

9) Prior to each flight, the PIC must inspect the UAS to ensure it is in a condition for safe flight. If the inspection reveals a condition that affects the safe operation of the UAS,

the UAS is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight. The Ground Control Station must be included in the preflight inspection. All maintenance and alterations must be properly documented in the aircraft records.

10) 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. The PIC who conducts the functional test flight must make an entry in the aircraft records.

11) The pre-flight inspection must account for all potential discrepancies, e.g. inoperable components, items, or equipment, not already covered in the relevant sections of the operating documents.

12) The operator must follow the UAS manufacturer's aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements.

13) The operator must carry out its maintenance, inspections, and record keeping requirements in accordance with the operating documents. Maintenance, inspection, alterations, and status of replacement/overhaul component parts must be noted in the aircraft records. This includes total time in service, description of work accomplished, and the signature of the authorized person returning the UAS to service.

14) Each UAS operated under this exemption must comply with all manufacturer Safety Bulletins.

15) The authorized person must make an entry in the aircraft record of the corrective action taken against discrepancies discovered between inspections.

16) The PIC must possess at least a private pilot certificate and at least a current third-class medical certificate. 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.

17) The operator may not permit any PIC to operate unless the PIC meets the operator's qualification criteria and 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). The PIC must ensure that the VO is trained appropriately in order to fulfill her or her duties. A record of training must be documented and made available upon request by the Administrator. Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) are permitted under the terms of this exemption. However, training 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.

18) 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.

19) The UA may not operate within 5 nautical miles of an airport reference point as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airport's management is obtained, and the operation is conducted in accordance with a Notice to Airmen (NOTAM), as required by the operator's Certificate of Waiver or Authorization (COA). The letter of agreement between the petitioner and the airport management must be made available to the Administrator upon request.

20) 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.

21) If the UA loses communications or loses its GPS signal, it must return to a pre-determined location within the planned operating area and land or be recovered in accordance with the operating documents.

22) The PIC must abort the flight in the event of unpredicted obstacles or emergencies in accordance with the operating documents.

23) The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough power to fly at normal cruising speed to the intended landing point and land the UA with 5 minutes battery power remaining.

24) All operations shall be conducted in compliance with the Air Traffic Organizations (ATO) issued certificate of Waiver or Authorization (COA) prior to conducting any operations under this grant of exemption. All operations conducted outside the U.S. 12 nm limit, must be conducted within airspace managed by the U.S. and within the U.S. Flight Information Region (FIR) boundary.

25) The operator must obtain an ATO issued COA prior to conducting any operations under this grant of exemption. This COA will require the operator to request a NOTAM not more than 72 hours in advance, but not less than 48 hours prior to the operation. All operations shall be conducted in accordance with airspace requirements in the ATO issued COA including class of airspace, altitude level and potential transponder requirements.

26) 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.

27) Before conducting operations, the radio frequency spectrum used for operation and control of the UA must comply with the Federal Communications Commission (FCC) or other appropriate government oversight agency requirements.

28) The 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 UAS is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

29) The UA must remain clear of and yield the right of way to all other aviation operations and activities at all times.

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

31) The UA may not be operated over congested or densely populated areas.

32) 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 and/or;

    b) The aircraft is operated near vessels, vehicles, or structures where the owner/controller of such vessels, vehicles, or structures has granted permission 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, and;

    c) Operations nearer to the PIC, VO, operator trainees or essential persons do not present an undue hazard to those persons per § 91.119(a).

33) 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.

34) Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported

to the FAA's UAS Integration Office (AFS-80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

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.

Issued in Washington, DC, on March 13, 2015.

/s/
John Barbagallo
Acting Deputy Director, Flight Standards Service