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

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

June 23, 2015

Exemption No. 11865
Regulatory Docket No. FAA–2015–0478

Mr. Courtney Bateman
Counsel for SkySpecs, Inc.
1301 K Street NW, Suite 1100 East Tower
Washington, DC 20005

Dear Mr. Bateman:

This letter is to inform you that we have granted your request for exemption. It transmits our decision, explains its basis, and gives you the conditions and limitations of the exemption, including the date it ends.

By letter dated February 24, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of SkySpecs, Inc. (hereinafter petitioner or operator) for an exemption. The exemption would allow the petitioner to operate an unmanned aircraft system (UAS) to conduct visual inspection and photography of vertical structures.

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

The FAA has determined that good cause exists for not publishing a summary of the petition in the Federal Register because the requested exemption would not set a precedent, and any delay in acting on this petition would be detrimental to the petitioner.

Airworthiness Certification

The UAS proposed by the petitioner is a DJI S900.

In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA

finds that relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates,* and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

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

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

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

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, SkySpecs, 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 collection. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

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

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

1. Operations authorized by this grant of exemption are limited to the DJI S900 when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

2. Operations for the purpose of closed-set motion picture and television filming are not permitted.

3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.

4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude must be reported in feet AGL.

5. The UA must be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate or U.S. driver's license.

6. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. The VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents, the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then

the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS−80) may be contacted if questions arise regarding updates or revisions to the operating documents.

8. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g., replacement of a flight critical component, must undergo a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.

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

10. Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, e.g., inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.

11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.

12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.

13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal Government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However,

training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.

16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.

17. The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.

18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.

19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.

20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least 5 minutes or with the reserve power recommended by the manufacturer if greater.

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

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N−Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.

23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating.

These documents must be made available to the Administrator or any law enforcement official upon request.

24. The UA must remain clear and give way to all manned aviation operations and activities at all times.

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

26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
    a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and
    b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

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

27. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative. Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.

28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS−80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

If this exemption permits operations for the purpose of closed-set motion picture and television filming and production, the following additional conditions and limitations apply.

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.

30. At least 3 days before aerial filming, the operator of the UAS affected by this exemption must submit a written Plan of Activities to the local Flight Standards District Office (FSDO) with jurisdiction over the area of proposed filming. The 3-day

notification may be waived with the concurrence of the FSDO. The plan of activities must include at least the following:

a. Dates and times for all flights;
b. Name and phone number of the operator for the UAS aerial filming conducted under this grant of exemption;
c. Name and phone number of the person responsible for the on-scene operation of the UAS;
d. Make, model, and serial or N−Number of UAS to be used;
e. Name and certificate number of UAS PICs involved in the aerial filming;
f. A statement that the operator has obtained permission from property owners and/or local officials to conduct the filming production event; the list of those who gave permission must be made available to the inspector upon request;
g. Signature of exemption holder or representative; and
h. A description of the flight activity, including maps or diagrams of any area, city, town, county, and/or state over which filming will be conducted and the altitudes essential to accomplish the operation.

31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

Unless otherwise specified in this grant of exemption, the UAS, the UAS PIC, and the UAS operations must comply with all applicable parts of 14 CFR including, but not limited to, parts 45, 47, 61, and 91.

This exemption terminates on June 30, 2017, unless sooner superseded or rescinded.

Sincerely,

/s/
John S. Duncan
Director, Flight Standards Service

Enclosures

ReedSmith

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February 24, 2015

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

Re: SkySpecs Request for Exemption from Certain Regulations per Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11, SkySpecs hereby applies for an exemption from the listed Federal Aviation Regulations ("FARs") to allow business use (commercial operation) of its sUASs, so long as such operations are conducted within and under the conditions outlined herein or as may be established by the FAA as required by Section 333.[1]

I. INTRODUCTION

SkySpecs is an Ann Arbor, Michigan based company born from research out of the University of Michigan College of Engineering. The team's combined expertise in robotics enabled them to develop sense-and-avoid technology for Small Unmanned Aircraft Systems (sUAS). SkySpecs is founded on demonstrated success in autonomously navigating previously unmapped, uninhabited "disaster zones" through the AUVSI International Aerial Robotics Competition, AUVSI RoboBoat Competition, and DARPA MAGIC competition. SkySpecs has designed its commercial system with a pilot in-the-loop to empower them to become more confident and safe in operations near structures and other obstacles.

SkySpecs intends to operate sUAS to conduct visual inspection of vertical structures. The sUASs will be equipped to conduct aerial photography, multi-spectral imaging and 3D laser scanning for the purpose of structural and/or conditional assessment of large wind turbines, monopole towers and blades, high voltage electrical transmission monopoles and towers, tall communication monopoles and towers, and flare stacks.

SkySpecs has developed a proprietary near-field collision detection and avoidance system called 'Guardian'. The only sUAS(s) that SkySpecs plans to operate will be equipped with fully-functioning

[1] For consistency and ease of FAA review, SkySpecs' request generally tracks, in format and content, the initial requests for exemption filed by various film industry sUAS operators. SkySpecs gratefully acknowledges their work in this regard.

Guardian systems. Once equipped and operational, Guardian will enable any sUAS to be knowledgeable of its surroundings and will automatically override pilot input and slow movement toward an obstacle, eventually coming to a complete stop at a safe distance. This distance is known as the "threshold distance," which is adjustable before every flight, until the pilot inputs a command that would direct the vehicle away from the threshold, reclaiming full control.

Guardian remains a fully-aware, yet passive, system for the duration of the flight when the pilot does not direct the vehicle to penetrate the threshold distance. Guardian renders any outfitted sUAS unable to fly within the threshold distance, even under the event that a wind gust pushes it toward the obstacle. This technology allows the pilot to fly close to a target structure removing the risk and associated danger of getting too close, while also decreasing the public's perceived risk of sUAS flight.

Contact:

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Specific Regulations from which the exemption is requested:[2]

14 CFR 61.113 (a) & (b)
14 CFR 91.7(a)
14 CFR 91.119(b) & (c)
14 CFR 91.121
14 CFR 91.151 (a)
14 CFR 91.405 (a)
14 CFR 407 (a) (1)
14 CFR 409 (a) (1) & (2)
14 CFR 417 (a) & (b)

It is obvious that Congress' goal in passing Section 333(a) through (c) of the Reform Act was to provide, in that legislation, a mechanism for such exemption requests. Through these Section 333 exemption provisions, Congress has directed the Secretary of Transportation to fairly consider whether

[2] SkySpecs intends to comply with 14 C.F.R. 91.9(b) and 14 CFR 91.203(a) and (b) in accordance with the FAA Chief Counsel's August 8, 2014 Memorandum, "Interpretation regarding whether certain required documents may be kept at an unmanned aircraft's control station."

certain unmanned aircraft systems may operate safely in the national airspace system (NAS) before completion of the rulemaking required under Section 332 of the Reform Act.

In making this determination, the Secretary is required to determine which types of UASs do not create a significant hazard to users of the NAS, or the public, or pose a threat to national security in light of the following:

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

Reform Act § 333 (a): Lastly, if the Secretary determines that such vehicles "may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft in the national airspace system." *Id.* §333(c) (emphasis added).

Moreover, the Administrator may grant an exemption from a requirement of a regulation prescribed under subsection (a) or (b) of this section or any sections 44702-44716 of this title if the Administrator finds the exemption in the public interest. 49 U.S.C. §44701(f) *See also* 49 USC §44711(a); 49 USC §44704; 14 CFR §91.203 (a) (1).

II. SKYSPECS' PROPOSED OPERATIONS DO NOT CREATE SIGNIFICANT HAZARDS

The sUAS's utilized by SkySpecs are electric multi-rotor craft, weighing less than 12 lbs. including payload. They operate at a speed of no more than 22 knots and have the capability to hover, and/or move in a vertical and horizontal plane simultaneously. They will only be operated as visual line of sight (VLOS), and remain under 400ft. in elevation above ground, and will operate only with permission of the owners of the facilities being inspected (Wind Farm Operators, Electrical Utilities, Telecommunication Facilities Owners, or Flare Stack Owners).

Additionally, the proposed operations involve aerial inspection of unoccupied structures, generally built upon right of ways with adequate buffer to protect the public from physical harm or invasion of privacy during inspection operations. For example, most utility structures are in the middle of a right of way that is between 150-200 ft wide. SkySpecs' operations would remain within that right of way. Virtually all facilities being inspected are also generally remote and on land that is owned and exclusively operated by the utility company or structure owner.

During normal operations the site will be secured of any bystanders the same way the site is secured during an inspection and the inspectors will be the only people on site. They are equipped with hardhats, steel toed boots, and inspection equipment. SkySpecs' operations would remain vertically within the structure's footprint. Moreover, the facility's towers and land are already subject to obstruction marking, lighting and notification requirements set forth by the FAA, by which SkySpecs and its technology are prepared and able to abide. Similarly, telecommunications towers are

generally some distance from dwellings, and even those that are not are generally sited within a right of way, and SkySpecs' operations would remain within that right of way.

Moreover, as noted above, SkySpecs has developed a proprietary near-field collision detection and avoidance system called 'Guardian,' which establishes a threshold distance the sUAS will operate from the target structure. This technology allows the pilot to fly close to a target structure, while removing the risk and associated danger of getting too close, and also decreasing the public's perceived risk of sUAS flight.

SkySpecs has drafted, and submits confidentially, a Flight Operations Manual which discusses safety considerations, training and general operating procedures for the proposed operations. SkySpecs has also drafted, and submits confidentially, an sUAS Aircraft Flight Manual which sets for the specifications, inspection and setup of the sUAS intended for use in the proposed operations.

III. SKYSPECS' PROPOSED OPERATIONS ARE IN THE PUBLIC INTEREST

By the clear language of Section 333, SkySpec's proposed operations are in the public interest because they advance Congress's explicit goal of getting commercial sUAS flying in the United States safely and soon. SkySpec's operations are exactly the "dull, dirty [and] dangerous" operations which the FAA has recognized as perfectly suited for UAS operations. *See, e.g.*, statement of Jim Williams, Manager, FAA UAS Integration Office, contained transcript of "FAA UAS Online Listening Session, April 3, 2013," ("[I]nspecting high-tension wire electrical towers all over the United States [is] high-risk operations, which are well suited for a UAS.").

Current alternatives utilized for these inspections and/or assessments include: ground based inspections (limited in effectiveness); access with high reach man lifts (limited in elevations that can be reached); physical climbing of the poles/towers; and inspections or assessments conducted from conventional aircraft (primarily helicopters). All are dangerous compared to the safer use of a sUAS as proposed by SkySpecs.

A 2009 "Safety Guide for Helicopter Operations" published by the Utilities, Patrol and Construction Committee of Helicopter Association International stated that "between 1979 and May 2007 there were 25 helicopter accidents with 43 fatalities conducting utility work in the US. Generally . . . a collision with wires while conducting these operations will result in fatalities and/or serious injuries to the crews and total loss of the aircraft."[3]

[3] See, "UPAC Safety Guide for Helicopter Operators," found online at http://www.rotor.com/AboutHAI/Committees/UtilitiesPatrolandConstruction.aspx.

The AFL-CIO reviewed OSHA statistics regarding aerial lift accidents between 1992 and 1999 and concluded that an average of 26 construction workers die each year from using aerial lifts, with the majority of deaths resulting from electrocutions and falls.[4]

A 2011 newspaper article regarding wind and solar-powered installations noted 78 wind-turbine related fatalities since the 1970s.[5] Similarly, an investigation of the telecommunications tower industry found that, between 2003 and 2010, the average fatality rate for the tower industry was more than 10 times greater than the construction industry, with 13 worker deaths in 2013 alone.[6]

SkySpecs strongly believes that allowing it to conduct these types of operations using an sUAS would substantially reduce the injuries and fatalities which have resulted from existing methods of inspection. SkySpecs believes that this reduction in injuries and fatalities demonstrates both that the operations substantially exceed the equivalent level of safety found in the FARs, and that granting this exemption is in the public interest. 49 USC 44701(f). *See also* 49 USC §44711(a); 49 USC §44704; 14 CFR §91.203 (a) (1).

Accordingly, SkySpecs respectfully requests that the FAA grant the requested exemption without delay.

IV. EQUIVALENT LEVEL OF SAFETY

SkySpecs proposes that the exemption requested herein apply to civil aircraft that have the characteristics and operate with the limitations listed herein. These limitations, as listed below, provide for at least an equivalent or even higher level of safety to operations under the current regulatory structure.

These limitations and conditions to which SkySpecs agrees to be bound when conducting commercial operations under an FAA issued exemption include:

The sUAS utilized by SkySpecs will weigh less than 12 lbs.

Flights will be operated within visual line of sight (VLOS) of a pilot in constant control of the craft.

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[4] See, "Deaths from Aerial Lifts," found online at http://www.elcosh.org/document/1417/d000484/Deaths%2BFrom%2BAerial%2BLifts.html?show_text=1.

[5] "More Accidents Feared as Wind, Solar-Powered Installations Spread," 8.14.11 Los Angeles Times article, found online at http://www.toledoblade.com/Energy/2011/08/14/More-accidents-feared-as-wind-solar-power-installations-spread.html.

[6] "Cell Tower Worker Fatalities Continue: More than a Dozen Deaths since 2012," 1.16.14 article found online at http://scienceblogs.com/thepumphandle/2014/01/16/cell-tower-worker-fatalities-continue-more-than-a-dozen-deaths-since-2012/.

Maximum total flight time for each operational flight will be approximately 25 minutes. Flights will be safely landed when the battery falls below its nominal voltage should that occur prior to the 25 minute limit. SkySpecs has developed a multispectral killswitch that is able to safely bring the UAS to the ground in the event of a failure, including loss of communication with the primary controller, motor failure, or battery failure.

V. EXEMPTIONS REQUESTED

14 C.F.R. §61.113(a) and (b): Private vs. Commercial Pilot Certificates

Sections 61.113(a) and (b) prohibit private pilots from operating an aircraft for compensation or hire. SkySpecs proposes that its pilots will have at least a private pilot's certificate, and a Class II medical. Its operations will be conducted over private property, in a sterile area as reflected in SkySpecs' Flight Operations Manual. For the reasons set forth in the FAA's grant of an exemption to Astraeus Aerial, SkySpecs does not believe a commercial pilot certificate is necessary for the operations it intends to conduct. *See, e.g.*, In the matter of the petition of Astraeus Aerial, Exemption No. 11062 (issued Sept. 25, 2014). For those reasons, SkySpecs requests an exemption from 14 C.F.R. §61.113(a) and (b).

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

Section 91.7 prohibits operation of an unairworthy aircraft, and places responsibility for airworthiness determinations on the pilot in command. The sUAS will not have an airworthiness certificate, and there is no FAA regulatory standard for determining airworthiness of the sUAS. Additionally, SkySpecs' operating documents set forth inspection and maintenance procedures to ensure airworthiness. For these reasons, and in accordance with the FAA's grant of an exemption from 91.7 to Total Safety U.S., Inc., SkySpecs requests an exemption from 14 CFR. §91.7(a). *See, e.g.*, In the matter of the petition of Total Safety U.S., Inc., Exemption No. 11156 (issued Jan. 29, 2015).

14 C.F.R. §91.119(b) and (c): Minimum Safe Altitudes

Section 91.119 establishes safe altitudes for operation of civil aircraft. Section 91.119(b) prohibits aircraft in congested areas from flying less than 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft. To the extent that the structures that SkySpecs would be inspecting are considered to be in "congested areas,"[7] SkySpecs' operational procedures, and the size, weight and speed of the sUAS, provide an equivalent level of safety such that operations at lower altitudes should be allowed.

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[7] The FAA Office of the Chief Counsel has indicated that whether an area is "congested" is determined on a case-by-case basis. See, e.g., June 18, 2012, Memorandum from Rebecca B. MacPherson, Assistant Chief Counsel for Regulations, to James E. Gardner, Manager, Flight Standards Division, re "To what extent an operator can make a congested area uncongested."

As described in its Flight Operations Manual, SkySpecs will establish a 500' buffer/sterile area for its operations that will exclude personnel not associated with the operations. SkySpecs will also exercise additional control over the sterile area as needed, as set forth in the Manual. Consequently, SkySpecs believes these procedures will reduce or eliminate any potential adverse impacts to safety for operations in congested areas. SkySpecs therefore requests an exemption from 14 CFR § 91.119(b).

Section 91.119 (c) prohibits operations in other than congested areas below 500 feet above the surface, or closer than 500 feet to any person, vessel, vehicle or structure. As this exemption is for an sUAS that flies similarly to a helicopter and the exemption requests authority to operate at altitudes up to 400 AGL, an exemption may be needed to allow such operations.

The equivalent level of safety will be achieved given the size, weight, speed of the UAS as well as the location where it is operated. As discussed above, SkySpecs' Flight Operations Manual provides for establishment of a sterile area, included safety buffers of 500 feet for personnel not associated with the operation. A 100 foot safety buffer will be in place for authorized personnel associated with the operation, unless the PIC determines a reduced buffer is essential to the current operation. SkySpecs therefore requests an exemption from Section 91.119(c) for all authorized personnel associated with the operation.

14 C.F.R. §91.121 Altimeter Settings

This regulation requires each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "… to the elevation of the departure airport or an appropriate altimeter setting available before departure." As the sUAS may not have a barometric altimeter, but instead a GPS altitude read out, an exemption may be needed.

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

Section 91.151 (a) prohibits an individual from beginning "a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing, and, assuming normal cruising speed – (1) During the day, to fly after that for at least 30 minutes; or (2) At night, to fly after that for at least 45 minutes."

Maximum total flight time for each operational flight will be approximately 25 minutes. Flights will be safely landed when the battery falls below its nominal voltage, should that occur prior to the 25 minute limit. The DJI S900 sUAS has Low Voltage Protection which alerts when the battery reaches pre-set levels. SkySpecs believes that an equivalent level of safety can be achieved by setting the Low Voltage Protection to alert when the aircraft battery reaches its nominal voltage of 22.2 volts. This restriction would be more than adequate to return the sUAS to its planned landing zone from anywhere in its limited operating area.

In addition, SkySpecs has developed a multispectral killswitch that is able to safely bring the UAS to the ground in the event of a failure, including loss of communication with the primary controller, motor failure, or battery failure. For these reasons, SkySpecs requests an exemption from 14 C.F.R. §91.151(a).

Similar exemptions have been granted to other operations, including Exemptions 2689F, 5745, 10673, and 10808.

14 C.F.R. §91.405 (a); 407 (a) (1); 409 (a) (1) & (2); 417(a) & (b): Maintenance Inspections

These regulations require that an aircraft operator or owner "shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in part 43 of this chapter ...," and others shall inspect or maintain the aircraft in compliance with Part 43.

As provided in SkySpecs' Operations Manual, the operator will ensure that the UAS is in working order prior to initiating flight, perform required maintenance and inspections, and keep a log of any maintenance performed.

VI. REGULATIONS FOR WHICH EXEMPTIONS ARE UNNECESSARY

The Federal Aviation Administration just issued a number of exemptions for UAS operations in filming of movies. In those exemptions, the agency noted that exemptions from certain regulations were not necessary, due to "the size, weight, speed and limited operating area associated with [the UASs] and its operation."

Based upon the FAA's guidance, and the fact that SkySpecs' UAS is even smaller and slower than those proposed by the film-making industry, SkySpecs believes exemptions from the following regulations are not necessary:

14 C.F.R. Part 21, Subpart H: Airworthiness Certificates
14 C.F.R. §45.23 (b). Marking of the Aircraft
14 C.F.R. §91.7(b): Civil aircraft airworthiness.
14 C.F.R. §91.109: Flight instruction.

SkySpecs also believes that an exemption from 14 C.F.R. §91.103: Preflight Action, is not necessary. This regulation requires each pilot in command to take certain actions before flight to insure the safety of flight. An FAA approved rotorcraft flight manual will not be provided for the aircraft. An equivalent level of safety will be provided as set forth in the operating documents submitted as part of this request.

The FAA has previously found that adherence to procedures contained in an applicant's operating documents demonstrate compliance with §91.103, and therefore an exemption from the regulation

was not necessary. *See, e.g.*, In the matter of the petition of Total Safety U.S., Inc., Exemption No. 11156 (issued Jan. 29, 2015).

As detailed in its operating documents, SkySpecs' PIC will take all actions including reviewing weather, flight battery requirements, landing and takeoff clearance distances and aircraft performance data before initiation of flight to ensure the safety of the flight. Consequently, in light of the agency's prior finding in Total Safety U.S., Inc., SkySpecs does not believe an exemption from 14 C.F.R. §91.103 is necessary.

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

> SkySpecs seeks an exemption from the following rules:
>
> 14 C.F.R. §61.113(a) and (b); 91.7 (a); 91.119(b) and (c); 91.121; 91.151(a); 91.405 (a); 91.407 (a) (1); 91.409 (a) (1) & (2) and 91.417 (a) & (b) to operate commercially a small unmanned vehicle (12 lbs or less) for the purpose of conducting structural and conditional assessments on high voltage electrical transmission monopoles and towers, tall communication monopoles and towers, large wind turbine monopole towers and blades, and flare stacks.
>
> Approval of exemptions allowing commercial operations of sUASs for these applications will enhance safety by reducing risk. Conventional means for performing these assessments require either physically climbing the poles or towers, using ropes to rappel down the tower from the top of the tower, using high-reach man lifts to access the towers (limited reach), or using conventional helicopters operating at extremely low altitudes over the subject structure being photographed. These conventional means all pose risks to persons and property.
>
> In contrast, a sUAS weighing fewer than 12 lbs. and powered by batteries, eliminates virtually all of that risk given the reduced mass and lack of combustible fuel carried on board. The sUAS is carried to the project site and not flown. The sUAS will carry no passengers or crew and, therefore, will not expose them to the risks associated with manned aircraft flights, ground-based aerial lift (bucket truck) operations, or manual climbing and inspection operations.
>
> The operation of small UASs, weighing less than 12 lbs., conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting SkySpecs from the requirements of Part 21 and allowing commercial operations. These lightweight aircraft operate at slow speeds, close to the ground, and in a low population environment and, as a result, are far safer than conventional alternatives.

Privacy

All flights will occur over private or controlled access property with the property owner's prior consent and knowledge.

Satisfaction of the criteria provided in Section 333 of the Reform Act of 2012 -- size, weight, speed, operating capabilities, proximity to airports and populated areas and operation within visual line of sight and national security – provide more than adequate justification for the grant of the requested exemptions allowing commercial operation of SkySpecs' sUAS in the inspection of electrical, telecommunication wind energy and flare stack structures pursuant to the Manual appended hereto.

Sincerely,

Courtney R. Bateman
Reed Smith LLP
Counsel for SkySpecs

/Signed/

John McGraw
John McGraw Aerospace Consulting
Consultant to SkySpecs

CRB:lsj