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

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

August 20, 2015

Exemption No. 12535
Regulatory Docket No. FAA−2015−1479

Mr. David Twining
Planck Aerosystems, Inc.
3106 Maple Street
San Diego, CA 92014

Dear Mr. Twining:

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 letters dated April 21 and July 8, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Planck Aerosystems, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial imaging over the ocean and other waterways.

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 the Leptron RDASS.

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

The Basis for Our Decision

You have requested to use a UAS for aerial data collection[1]. 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, Planck Aerosystems, 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

[1] 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.

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, Planck Aerosystems, 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 Leptron RDASS 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 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.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 August 31, 2017, unless sooner superseded or rescinded.

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

Enclosures

21 April 2015

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

Re: Exemption Request Under 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 ("Reform Act") and 14 C.F.R. Part 11, Planck Aerosystems Inc requests an exemption from several provisions of the the Federal Aviation Regulations ("FARs") identified below, to allow commercial operations of RDASS small unmanned aerial system (sUAS) for aerial imaging of objects on or below the surface of the ocean or other waterways, so long as such operations are conducted within and under conditions outlined herein or as may be established by the FAA as required by Section 333.

The RDASS is an all-weather, electric powered, quad rotor, vertical takeoff and landing (VTOL) sUAS that is capable of capturing and transmitting live airborne video and still photographs as well as health and status information to a ground control station (GCS). The RDASS has a maximum weight of 3.5 pounds fully loaded, can fly for up to 45 minutes with extended battery pack, and comes equipped with dual redundant radios for command and control that operate at 900 MHz and 2.4 GHz.

The RDASS is built by Leptron of Denver, Colorado, and is distributed by HSE-UAV of Illinois. It was developed for military and first responder applications, but has been repurposed for commercial and civil uses. The RDASS sUAS was selected for its ability to fly in moderate and gusty winds and rain, as well as general weatherproofness so that it can survive occasional splashes that may be encountered, thereby improving its overall reliability and safety. It also has an established maintenance schedule provided by the manufacturer.

This exemption would apply to operation of the sUAS by a pilot who hold a commercial pilot license, have a valid medical certification, and have thoroughly reviewed all manuals and documentation provided by the aircraft manufacturer. In addition, aircraft maintenance will be performed at regular intervals according to the manufacturer's maintenance plan.

The RDASS's capabilities, along with Planck Aerosystems' pilots experience, make it ideally suited to conduct aerial surveying and identification of surface and subsurface objects in water, including boats, logs, fish, rocks, kelp, reefs, marine mammals, etc. The aircraft will be operated with the following restrictions:

- All operations will occur in the field within Visual Line of Sight (VLOS) in Class G airspace with both a Pilot in Command (PIC) as well as a nearby Visual Observer (VO) who will be within voice distance of the PIC at all times.
- Operation would occur at no more than 400' AGL, typically over water, except for take-off and landing procedures.
- The aircraft will not operate over populated areas
- The aircraft will not be operated over assemblies of people
- The aircraft will not operate within 5NM of an airport
- The aircraft will only be operated in good weather with light winds predicted

As a result of the RDASS's size, weight, speed, range, capabilities, and reliability, as well as the limited operation over water and far from populated areas detailed in this petition, it does not pose a hazard to the public or any users of the national airspace. In addition, it does not pose a threat to national security. In fact, granting this exemption would be in the public's interest and benefit the public as a whole by permitting the detailed mapping of subsurface obstacles, and enabling applications for marine science and maritime security.

The name and contact information of the application are:

Planck Aerosystems, Inc
Attn: David Twining
Address: 3106 Maple Street, San Diego, CA 92014
Phone: (510) 292-6235
Email: dave@planckaero.com

Planck Aerosystem's exemption request includes the following regulations, with additional details below:

14 CFR Part 21
14 CFR 45.23
14 CFR 45.27
14 CFR 45.29
14 CFR 91.119
14 CFR 91.121
14 CFR 91.151
14 CFR 91.405
14 CFR 91.407
14 CFR 91.409
14 CFR 91.417

14 CFR Part 21, Subpart H: Airworthiness Certificates

The RDASS aircraft is safe and fit for operation under the conditions listed in this petition. In particular, the aircraft will be flown for research and development purposes exclusively over water, far from people or other vessels, in Class G airspace. The aircraft will not carry persons or fuel, is small and lightweight, and is at least as safe as manned aircraft performing the same operation. Subject to the conditions and limitations listed in this petition, the aircraft meets the requirements for an equivalent level of safety.

14 CFR 45.23 Display of marks; general; 14 CFR 45.27 Location of marks; nonfixed-wing aircraft; 14 CFR 45.29 Size of marks

The small UAS included in this petition does not include certain features, such as cabin or cockpit, to mark according to this regulation. In addition, the aircraft is too small to legibly accommodate the lettering size listed in the regulation. In lieu of this, we propose marking the aircraft with the word "Experimental" and/or other identifying numbers in as large of letters as possible such that the PIC and VO may be suitably able to identify the aircraft. In addition, the ground control station will also be clearly marked to make it clear to observers that it is associated with the sUAS.

14 CFR 91.119 Minimum safe altitudes: General

This regulation establishes safe alitudes for operation of aircraft, and requires that the aircraft may not operate closer than 500 feet to any person, vessel, vehicle, or structure. Since the aircraft listed in this petition will operate at a maximum of 400 feet AGL, it cannot meet the requirements of the regulation. However, it will not be operated in congested or populated areas, nor will it operate directly above people at any time. If power fails for any reason during flight, the aircraft will fall safely into water without risk to people or property.

14 CFR 91.121 Altimeter settings

An exemption to this regulation is requested because the sUAS is not equipped with a barometric altimeter. Instead, it is equipped with a GPS device that determines and displays altitude based on the GPS satellite network. The ensure an equivalent level of safety, the PIC will confirm the readings and function of the GPS device prior to each flight, and continue to monitor it throughout the flight.

14 CFR 91.151(b) Fuel requirements for flight in VFR conditions

This regulation requires that there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, to fly after that for at least 20 minutes. The sUAS included in this petition is battery powered and has a maximum endurance of less than 60 minutes. Given the small size and weight, along with proposed operating environment, an exemption from this regulation poses no additional risks. We propose reducing the regulation to 10 minutes of reserve, which would be adequate for the sUAS to safely return to the planned landing zone from anywhere in its operating area.

14 CFR 91.405 Maintenance required; 14 CFR 91.407 Operation after maintenance, preventive maintenance, rebuilding, or alteration; 14 CFR 91.409 Inspections; 14 CFR 91.417 Maintenance records

We feel that we can provide and equivalent level of safety with an exemption from these regulations, provided that the PIC perform regular inspections, log details of usage and any maintenance that is performed, and complies with the manufacturers maintenance schedule. The PIC is the person most

familiar with the aircraft and is best suited to ensure that the aircraft is in an airworthy condition prior to every flight. Given the overall small size and simplicity of the aircraft, we feel that the PIC can ensure an equivalent level of safety.

Federal Register Summary

The following summary is provided for publication in the Federal Register.
Exemptions sought: 14 CFR Sections 21, 45.23, 45.27, 45.29, 91.119, 91.121, 91.151, 91.405, 91.407, 91.409, 91.417
Description of the nature of the exemption: Planck Aerosystems is seeking an exemption to conduct aerial surveying operations using small aerial unmanned vehicles over bodies of water.

We are prepared to amend this request for exemption to satisfy the FAA's recommendation on providing equivalent level of safety. Please contact us for any additional information or clarification.

Sincerely,

David Twining
Chief Operating Officer
Planck Aerosystems

Appendix A
Additional Aircraft Information

Figure 1: The RDASS Shown in Flight

Figure 2: RDASS Shown Packed into its Case for Safe Transportation

There are many videos on YouTube, published by the RDASS manufacturer and distributor, that show the typical RDASS deployment and operation. Several examples include:
https://youtu.be/AJ4TI2L8oFA
https://youtu.be/82Gtait3M-M
https://youtu.be/8MAmpCr7mjI

Appendix B
Link to Maintenace Schedule Information

http://www.hse-uav.com/products_maintenance.htm

Ammendment 1

8 July 2015

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

Re: Ammendment to Exemption Request Under Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations, FAA-2015-1479

Dear Sir or Madam:

The following constitutes an amendment to Planck Aerosystems request for exemption that was entered into the public docket on 21 April 2015 (No FAA-2015-1479). It is in response to the letter titled *U.S. DOT/FAA - Request for Additional Information* that was posted in the docket on 26 June 2015. In particular, the letter requests detail on how the exemption request complies with section 11.81(d) of the 14 CFR rulemaking procedures.

Public Interest

Granting the exemption request to Planck Aerosystems would be in the public interest and benefit the public as a whole. The goal of the exemption request is to operate a small unmanned vehicle over bodies of water in order to conduct aerial surveying and identification of surface and subsurface objects in water, including boats, logs, fish, rocks, kelp, reefs, marine mammals, etc. Such surveys are both scientifically and agriculturally relevant to the public interest.

From a scientific perspective, there is a consistent need to survey and monitor objects, including marine life, in the water. Many efforts by public agencies seek data obtained by these surveys. In many cases, these surveys much be conducted at a very high cost from deployed equipment, or at increased safety risks from manned aircraft. Conducting surveys over water from small unmanned vehicles enables access to high quality data at a much lower cost and risk than what is currently available. Members of the public scientific community that would benefit include, but is not limited to, NOAA, universities, fish and wildlife agencies, and other research institutions.

Fishing is a major component of the country's agricultural production. As such, it is important for fisherman to catch fish in an efficient and sustainable manner. Aerial surveys and monitoring over bodies of water provides information that fisherman can use to reduce their fuel use, reduce their bycatch, and ensure that they are operating in a safe and sustainable way. This applies equally to wild caught fish as well as fish farming (aquaculture). This benefits the public interest by helping ensure that

the nation's fisheries are sustainably harvested and the public has access to reasonably priced, highly nutritious fish.

Under these circumstances, it should be clear that conducting aerial surveying of surface and subsurface objects in water using small unmanned aerial vehicles in a safe manner is in the public interest and benefits the public as a whole.

All other considerations included Planck Aerosystems original exemption request remain unchanged. We are prepared to amend this request for exemption to satisfy the FAA's recommendation. Please contact us for any additional information or clarification

Sincerely,

David Twining
Chief Operating Officer
Planck Aerosystems