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

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

August 4, 2015

Exemption No. 12308
Regulatory Docket No. FAA–2015–1758

Mr. Steven K. Aisaka
Parametrix, Inc.
719 Second Avenue
Suite 200
Seattle, WA 98104

Dear Mr. Aisaka:

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 May 5, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Parametrix, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography, videography, surveying, photogrammetry, and inspections.

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 are the DJI Phantom 2 and SenseFly eBee.

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, Parametrix, 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.

[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.

Conditions and Limitations

In this grant of exemption, Parametrix, 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 Phantom 2 and SenseFly eBee 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

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

719 2ND AVENUE, SUITE 200 | SEATTLE, WA 98104 | P 206.394.3700

May 5, 2015

United States Department of Transportation
Docket Management System
1200 New Jersey Avenue SE
Washington, DC 20590

Re: **Petition for Exemption Request of Parametrix, Inc.**, under Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations from 14 C.F.R. Part 21; 14 C.F.R. 45.23(b); 14 C.F.R. 61.113 (a) & (b); 14 C.F.R. 91.7 (a); 14 C.F.R. 91.9 (b) (2); 14 C.F.R. 91.103; 14 C.F.R. 91.109; 14 C.F.R. 91.119; 14 C.F.R. 91.121; 14 C.F.R. 91.151(a); 14 C.F.R. 91.203 (a) & (b); 14 C.F.R. 91.405 (a); 14 C.F.R. 91.407 (a) (1); 14 C.F.R. 91.409 (a) (2); 14 C.F.R. 91.417 (a) & (b).

Dear Sir/Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11, Parametrix, Inc. (Parametrix), an operator of small Unmanned Aircraft Systems ("UASs") hereby applies for an exemption from the before mentioned Federal Aviation Regulations ("FARs") to allow commercial operation of its UASs. Parametrix will conduct its operations within and under the conditions of this petition or as established by the FAA in granting a Section 333 exemption to Parametrix.

The name and address of the applicant is:

Parametrix, Inc.
Attn: Steven K Aisaka
719 Second Avenue, Suite 200
Seattle, WA 98104
Ph.: 253-501-5206
Email: saisaka@parametrix.com

Specific Sections of 14 CFR from which Parametrix seeks an exemption:

14 C.F.R. Part 21
14 C.F.R. 45.23(b)
14 C.F.R. 61.113 (a) & (b)
14 C.F.R. 91.7 (a)
14 C.F.R. 91.9 (b) (2)
14 C.F.R. 91.103
14 C.F.R. 91.109
14 C.F. R. 91.119
14 C.F.R. 91.121
14 C.F.R. 91.151 (a)

14 C.F.R. 91.203 (a) & (b)
14 C.F.R. 91.405 (a)
14 C.F.R. 407 (a) (1)
14 C.F.R. 409 (a) (2)
14 C.F.R. 417 (a) & (b)

From offices throughout the western United States, Parametrix provides multidisciplinary engineering, planning and environmental science services in transportation, environmental planning and compliance, water resources, and community building. As a 100-percent employee-owned firm, our staff have a vested interest in strong performance and exceptional client service. Individually, and as a team, we are committed to providing high quality, cost-effective solutions that enable our clients to make informed decisions.

Parametrix seeks an exemption to be able to provide the following services to our public and private clients:

- Construction site observation and monitoring.
- Aerial surveying and photogrammetry.
- Photography and videography.
- Inspection of structures.

The requested exemptions would permit Parametrix to operate small, unmanned UASs under conditions that are 1) limited, 2) controlled, 3) economical, and 4) would provide safety enhancements over conventional aircraft. Approval of this exemption would thereby enhance safety to the public and fulfill the FAA'S responsibilities to establish requirements for the safe operation of such aircraft systems in the national airspace system.

Parametrix proposes to operate the DJI Phantom 2, and the senceFly eBee. The relevant user manuals of the UASs are attached. Parametrix's UASs weigh 55 or fewer pounds including payload. The UASs will be operated, under normal conditions, at a speed of no more than 100 mph and have the capability to move in the vertical and horizontal plane simultaneously. The UASs will be operated only in line of sight and only within a controlled area. These operations will insure that the UAS will not create a hazard to users of the national airspace system or the public.

Given the small size of the UASs involved and the restricted controlled environment which the UASs will operate, Parametrix falls within that zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA, by exemption, allow commercial operations of UASs to operate. Also, due to the size of the UASs and the controlled areas in which the UASs will operate, approval of the application presents no national security issue. Under Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, the equivalent level of safety surrounding the proposed operations, and the public benefit, including enhanced safety, reduction in environmental impacts, including reduced emissions associated with allowing UASs, the grant of the requested exemptions is in the public's interest.

Parametrix proposes that the exemption requested apply to civil aircraft that have the characteristics and that operate with the limitations listed. These limitations provide for at least an equivalent or even higher

level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to the existing safe operations conducted with conventional aircraft. These limitations and conditions to which Parametrix agrees to be bound when conducting commercial operations under an FAA issued exemption include:

1. The UAS will weigh less than 55 pounds (25 kg).
2. The UAS will be operated at a speed of no more than 100 mph.
3. Only visual line-of-sight ("VLOS") operations will be allowed; the UAS must remain within VLOS of the operator or a visual observer ("VO").
4. UAS operations will occur during daylight hours only.
5. No person may act as an operator or VO for more than one unmanned aircraft operation at one time.
6. Minimum crew for each operation will consist of the UAS Operator and a Visual Observer.
7. The UAS Operator will be Pilot in Command (PIC) who shall have completed the required FAA training, along with training from the manufacturer or distributor of the UAS.
8. The PIC will be vetted by the TSA and have a TSA Known Traveler Number, and have a valid driver's license from the State of the PIC's domicile.
9. The UAS will only operate within a confined controlled area of the flight operations area.
10. Maximum total flight time for each operational flight will be 30 minutes. Flights will be terminated at 20% battery power reserve, should that occur prior to the 30-minute limit.
11. A briefing will be conducted in regard to the planned UAS operations prior to each day's activities. It will be mandatory that all personnel who will be performing duties within the boundaries of the safety perimeter be present for this briefing.
12. The operator will obtain the consent of all persons involved and ensure that only consenting persons will be allowed within 100 feet of the flight operation, and this radius may be reduced to 30 feet based upon an equivalent level of safety determination.
13. UAS operations may not occur over any persons not directly involved in the operation.
14. PIC and VO will at all times be able to communicate by voice.
15. PIC will conduct preflight inspections to ensure the UAS is safe for operation.
16. The UAS will be required to yield right-of-way to all other aircraft, manned or unmanned.
17. Flights will be operated at an altitude of no more than 200 feet AGL.
18. The UAS will only operate in Class G airspace.
19. The UAS will stay certain distances away from airports or heliports:
    a. Five (5) nautical miles (NM) from an airport having an operational control tower; or
    b. Three (3) NM from an airport with a published instrument flight procedure, but not an operational tower; or
    c. Two (2) NM from an airport without a published instrument flight procedure or an operational tower; or
    d. Two (2) NM from a heliport with a published instrument flight procedure.
20. UAS operations will be permitted to occur only when conditions allow minimum weather visibility of 3 miles from the control station.
21. Written permission from the relevant property owners will be obtained.

22. All required permissions and permits will be obtained from territorial, state, county, or city jurisdictions, including local law enforcement, fire, or other appropriate governmental agencies.
23. If the UAS loses communication or loses its GPS signal, the UAS will have capability to return to a pre-determined location within the Security Perimeter and land.
24. The UAS will have the capability to abort a flight in case of unpredicted obstacles or emergencies.

Accordingly, Parametrix respectfully requests that the FAA grant the requested exemption.

The extent of relief you seek, and the reason you seek the relief:

14 C.F.R. Part 21, Subpart H: Airworthiness Certificates 14 C.F.R. 91.203 (a) (1).

Part 21 Subpart H, entitled Airworthiness Certificates, sets forth the procedural requirements for the issuance of airworthiness certificates as required by 14 C.F.R. 91.203 (a) (1). Given the limited size, weight, and operating area associated with the UAS to be utilized by Parametrix, an exemption from Part 21, Subpart H meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act. The Federal Aviation Act and Section 333 of the Reform Act authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular UAS.

The UASs operated by Parametrix is less than 55 pounds fully loaded, carries no pilot or passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a secured area. Operations under this exemption will be controlled and monitored by the operator and in compliance with the conditions of this document and also in compliance with any local public safety requirements. The FAA will have advance notice of all operations through a COA or more likely be operated under the "blanket" 200-foot COA.

In this case, an analysis of these criteria demonstrates that the UAS operated without an airworthiness certificate, in the restricted environment and under the conditions proposed, will be at least as safe, or safer, than a conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate without the restrictions and conditions proposed.

14 C.F.R. 45.23 (b). Marking of the Aircraft.

14 C.F.R. 45.23 prescribes that when marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted, or light-sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "light-sport," "experimental," or "provisional," as applicable.

Even though the UAS will have no airworthiness certificate, an exemption may be needed as the UAS will have no entrance to the cabin, cockpit, or pilot station on which the word "Experimental" can be placed. Given the size of the UAV, 2-inch lettering will not be possible. An equivalent level of safety will be the word "Experimental," at a size that is as large as practicable, will be placed on the fuselage in compliance with Section 45.29 (f). Additionally, Parametrix will mark its UASs with its company name and contact information.

14 C.F.R. 61.113 (a) & (b): Private Pilot Privileges and Limitations: Pilot in Command.

Sections 61.113 (a) & (b) limit private pilots to non-commercial operations.

Because the UAS will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations by requiring the PIC operating the aircraft to have successfully completed, at a minimum, FAA sport pilot ground instruction and passed the FAA Sport Pilot written examination or other FAA recognized equivalent training. The PIC will have also completed a manufacturer's training program for the model the PIC will be operating. Additionally, the PIC will have been vetted by the TSA by obtaining a Known Traveler Number which comes along with TSA Pre status, and possess a valid driver's license from the state of the PIC's domicile.

Unlike a conventional aircraft that carries the pilot and passengers, the UAS is remotely controlled with no living thing on board. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance. The level of safety provided by these requirements will be at least as safe, or safer, than that provided by a single individual holding a commercial pilot's certificate operating a conventional aircraft. The risks associated with the operation of the UASs are diminished from the level of risk associated with commercial operations contemplated by Part 61, when drafted, that allowing operations of the UAS as requested with FAA ground instruction and manufacturer's training exceeds the present level of safety achieved by 14 C.F.R. 61.113 (a) & (b).

14 C.F.R. 91.7(a): Civil aircraft airworthiness.

The regulation requires that no person may operate a civil aircraft unless it is in airworthy condition.

As there will be no airworthiness certificate issued for the UAS, should this exemption be granted, no FAA regulatory standard will exist for determining airworthiness of the UASs operated by Parametrix. Given the size of the aircraft and the requirements contained in the manufacturer's manual for maintenance and use of safety check lists prior to each flight, an equivalent level of safety will be provided.

14 C.F.R. 91.9 (b) (2): Civil Aircraft Flight Manual in the Aircraft.

Section 91.9 (b) (2) provides that no person may operate a U.S.-registered civil aircraft . . . . (2) For which an Airplane or Rotorcraft Flight Manual is not required by Section 21.5 of this chapter, unless there is available in the aircraft a current approved airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

The Parametrix UAS, given its size and configuration, has no ability or place to carry such a flight manual on the aircraft, not only because there is no pilot on board, but because there is no room or capacity to carry such an item on the aircraft. The equivalent level of safety will be maintained by keeping the UAS flight manual at the ground control point where the PIC operating the UAS will have immediate access to it.

14 C.F.R. 91.103: Preflight action.

This regulation requires each pilot in command to take certain actions before flight to insure the safety of flight.

Because FAA-approved UAS flight manuals will not be provided for the aircraft, an exemption will be needed. An exemption is requested from this requirement as the PIC will take separate preflight actions, including checking the condition of the UAS, checking flight battery requirements, weather conditions, checking takeoff and landing distances, and all other actions in the User Guide and safety checklists. These actions will provide an equivalent level of safety.

14 C.F.R. 91.109: Flight instruction.

Section 91.109 provides that no person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls.

UASs, by their design, do not have fully functional dual controls. Flight control is accomplished through the use of a controls that communicate with the aircraft via radio communications. The equivalent level of safety provided by the fact that neither a pilot nor passengers will be carried in the aircraft and by the size and speed of the aircraft.

14 C.F.R. 91.119: Minimum safe altitudes.

Section 91.119 establishes safe altitudes for operation of civil aircraft. Section 91.119 (c) limits aircraft flying over areas other than congested areas to 500 AGL. Over sparsely populated areas, aircraft cannot be operated closer than 500 feet of any person, vessel, or structure.

This exemption is requested for minimum safe altitudes as Parametrix proposes to operate its UASs below 200 AGL. As set forth herein, the UAS will never operate at higher than 200 AGL. An equivalent level of safety will be achieved given the size, weight, and speed of the UAS, as well as the location where it is operated. Additionally, no flight operations will be made without the permission of the property owner or local officials.

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.

Because the UAS will not have a barometric altimeter, but instead a GPS altitude read-out, an exemption is requested. An equivalent level of safety will be achieved by confirming the altitude of the launch site shown on the GPS altitude indicator before flight.

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."

The intent of this requirement is to provide enough fuel or energy reserve in the event of delays due to congestion or weather at an airport. The typical battery powering a UAS provides approximately 40 minutes of powered flight. To meet the 30-minute reserve requirement in 14 CFR 91.151, Parametrix's UAS flights would be limited to approximately 10 minutes in length. Given that the limitations of an UAS proposed flight will be operated with visual line of sight and the location of its proposed operations within a predetermined area, a longer time frame for flight in daylight VFR conditions is reasonable. Parametrix believes that an equivalent level of safety can be achieved by limiting flights to 30 minutes or 20% of battery power, whichever happens first. This exemption would be more than adequate to return the UAS to the landing zone from anywhere in its limited operating area.

14 C.F.R. 91.203 (a) and (b): Carrying Civil Aircraft Certification and Registration.

The regulation provides in pertinent part:

(a) Except as provided in Section 91.715, no person may operate a civil aircraft unless it has within it the following:

(1) An appropriate and current airworthiness certificate. . . .

(b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under Section 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

The UAS has no cabin or cockpit, there is no ability or place to carry certification and registration documents or to display these documents on the UAS. As with 14 C.F.R. 91.9 (b) (2): Civil Aircraft Flight Manual in the Aircraft, an equivalent level of safety will be achieved by keeping these documents at the ground control point where the PIC operating the UAS will have immediate access to the documents, to the extent needed and applicable to the UAS.

14 C.F.R. 91.405 (a); 407 (a) (1); 409 (a) (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.

Because these sections and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply to Parametrix. The operator following the manufacturer's product and operating manual will accomplish maintenance. An equivalent level of safety will be achieved because Parametrix's UASs are very limited in size and will carry a small payload and operate only in restricted areas for limited periods of time. If mechanical issues arise, the UAS can immediately land and will be operating from no higher than 200 feet AGL. As provided in the manufacturer's manual, the operator will ensure that the UAS is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance performed.

Summary:

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: Applicant seeks an exemption from the following rules:

14 C.F.R. 21, subpart H; 14 C.F.R 45.23(b); 14 C.F.R. 61.113(a) & (b); 14 C.F.R. 91.7 (a); 14 C.F.R. 91.9 (b) (2); 14 C.F.R. 91.103(b); 14 C.F.R. 91.109; 14 C.F.R. 91.119; 14 C.F.R. 91.121; 14 C.F.R. 91.151(a); 14 C.F.R. 91.203(a) and (b); 91.405 (a); 14 C.F.R. 91.407 (a) (1); 14 C.F.R. 91.409 (a) (2); 14 C.F.R. 91.409 (a) (2); and 14 C.F.R. 91.417 (a) & (b) to operate commercially a small unmanned vehicle (55 pounds or less).

Approval of exemptions allowing commercial operations of UASs will enhance safety by reducing risk. Conventional operations, using jet or piston-power aircraft, operate at low altitudes just feet from the subjects being photographed and in close proximity to people and structures and present the risks associated with vehicles that weigh in the neighborhood of 4,000 pounds and carrying large amounts of aviation fuel. In contrast, a UAS weighing fewer than 55 pounds and powered by batteries eliminates almost all of that risk given the reduced weight and lack of combustible fuel carried on board. The UAS will carry no passengers or crew and, therefore, will not expose anyone to the risks associated with manned aircraft flights.

The operation of UASs, weighting less than 55 pounds, conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial operations. These lightweight aircraft operate at slow speeds, close to the ground, and in a controlled environment and, as a result, are far safer than conventional operations conducted with turbine helicopters operating in close proximity to the ground and people.

Additional Information:

Privacy

All flights will occur over private or public controlled access property with the property owner's prior consent and knowledge. Photography will be of people who have also consented to being filmed or otherwise have agreed to be in the area where filming will take place. The grant of this exemption request will provide improved safety in both day and night operations. 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 granting the requested exemptions allowing commercial operations.

Regards,

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Parametrix, Inc.

ATTACHMENT A – OPERATIONS MANUALS