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

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

September 3, 2015

Exemption No. 12469A
Regulatory Docket No. FAA–2015–2197

Mr. Tim Cutshaw
Mesa Associates, Inc.
9238 Madison Boulevard
Madison, AL 35758

Dear Mr. Cutshaw:

This letter is to inform you that we have granted your petition for an amendment. It explains the basis for our decision, describes its effect, and lists any changes to the original conditions and limitations.

By letter dated May 21, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Mesa Associates, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct utility infrastructure and equipment inspection. In the August 14, 2015 decision letter, the FAA was unable to approve the InstantEye MK2 Gen3 and the Pulse Aerospace Vapor 55. The FAA is now prepared to act on that request.

The FAA has determined that good cause exists for not publishing a summary of the petition in the Federal Register because the requested amendment to the exemption would not set a precedent, and any delay in acting on this petition would be detrimental to the petitioner. The unmanned aircraft authorized in the original grant are comparable in type, size, weight, speed and operating capabilities to those in this petition.

Airworthiness Certification

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, C*ertification procedures for products and parts,*

Subpart H—Airworthiness Certificates, and any associated noise certification and testing requirements of part 36, is not necessary.

Our Decision

The FAA has determined that the justification for the issuance of Exemption No. 12469 remains valid and is in the public interest. Therefore, under the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, the operator is granted an amendment to add new aircraft to its UAS operations.

The operator shall add this amendment to its original exemption.

Conditions and Limitations

All conditions and limitations within Grant of Exemption No. 12469 remain in effect except as follows. Condition No. 1 has been updated to reflect the additional aircraft.

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

1. Operations authorized by this grant of exemption are limited to the Aeryon SkyRanger, Aibotix X6, PrecisionHawk Lancaster Hawkeye, Pulse Aerospace Vapor 35, InstantEye Mk2 Gen 3, and the Pulse Aerospace Vapor 55 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.

This exemption terminates on August 31, 2017, unless sooner superseded or rescinded.

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

Enclosures

May 21, 2015

United States Department of Transportation
Docket Management System
1200 New Jersey Avenue SE
West Building Ground Floor, Room W12-140
Washington, DC 20590

Re: Exemption Request Pursuant To Section 333 of the FAA Reform Act of 2012

Dear Administrators:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 and 14 C.F.R. Part 11, Mesa Associates, Inc. (Mesa) is seeking exemption to safely operate commercial unmanned aerial vehicles or UAS under the conditions of this petition or as established by the FAA. The UAS operations proposed in this petition will be consistent with previously granted UAS Section 333 exemptions and FAA guidance.

Applicant Information:

Mesa Associates, Inc.
Attn: Tim Cutshaw
9238 Madison Blvd. Building 2 Suite 116
Madison, AL 35758
Phone: (865) 604-5402
Email: tcutshaw@mesainc.com

In business for twenty seven years, Mesa is a diverse engineering company with its corporate office located in Madison, AL. Additionally, we have five offices in the southeast, three offices on the west coast, and one on the east coast. Mesa has specialized talent in electrical substation and transmission line design and inspection, power generation, industrial facilities, and general critical infrastructure for the well-being of the nation.

Mesa seeks Section 333 exemption to provide the following services to our public and private clients. Mesa has developed safe operating practices to provide UAS inspection services including but not limited to:

1) Utility infrastructure and equipment including but not limited to substations power lines and towers, transmission power lines and towers, distribution towers, pipelines, and flare stacks.
2) Wind turbine blades and other structural aspects;
3) Solar power panels and structures;
4) Hydro power structures;
5) Fossil power structures;
6) Post storm damage assessment;
7) Real-estate and land surveying assessments;
8) Vegetation and line clearance for tree trimming near the infrastructure;
9) Environmental studies;
10) Industrial site inspection and monitoring;
11) Telemetry equipment such as cellular communications networks and structures;
12) Emergency response including search and rescue

The reason for such a broad exemption request is that Mesa hopes to utilize our experience to enhance public safety in our typical service areas arising in the future without the processing time associated with requesting additional section 333 exemptions. The requested exemptions would permit Mesa to operate small, unmanned UASs under conditions that are 1) limited, 2) controlled, and 3) 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.

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

Several regulations have been previously determined by other granted exemptions either not to be applicable or not to require relief, so these will not be addressed. The petitioner will accept any conditions and limitations as previous exemptions.

- 14 C.F.R. Part 21 — Certification procedures for products and parts
- 14 C.F.R. 45.23(b) — Display of marks
- 14 C.F.R. 61.113 (a) & (b) — Commercial pilot privileges and limitations
- 14 C.F.R. 91.7 (a) — Civil aircraft airworthiness
- 14 C.F.R. 91.9 (b) (2) — Civil aircraft flight manual, marking, and placard requirements
- 14 C.F.R. 91.103 — Preflight action
- 14 C.F.R. 91.109 — Flight instruction; simulated instrument flight and certain flight tests
- 14 C.F. R. 91.119 — Minimum safe altitudes
- 14 C.F.R. 91.121 — Altimeter settings
- 14 C.F.R. 91.151 (a) — Fuel requirements for flight in VFR conditions
- 14 C.F.R. 91.203 (a) & (b) — Civil aircraft: Certifications required
- 14 C.F.R. 91.405 (a) — Maintenance required
- 14 C.F.R. 407 (a) (1) — Operation after maintenance
- 14 C.F.R. 409 (a) (2) — Inspections
- 14 C.F.R. 417 (a) & (b) — Maintenance records

If granted a section 333 exemption, Mesa will operate UAS's weighing less than 55lbs including payload, operate under normal conditions at speeds allowed per a section 333 exemption. Our UAS's will operate only in line of sight and will operate only within a sterile area. Such operations will insure that our UAS's will "not create a hazard to users of the national airspace system or the public." It's Mesa's intention to preform our operations safely and in the best interest of the public. Inspection with UAS will provide a more efficient, thorough and safer means of inspection.

Mesa proposes to operate InstantEye (Mk2 Gen3) a small Unmanned Aircraft System (sUAS) manufactured by Physical Science Inc. weighing significantly less than 55lbs including payload. Mesa anticipates future purchases and requests section 333 exemptions to operate Aeryon SkyRanger, Aibotix X6, PrecisionHawk Lancaster Hawkeye, and Pulse Aerospace (Vapor 35 and Vapor 55) in compliance with Section 333 regulations. All Mesa UASs will operate, under normal conditions, at speeds of less than 100 mph and have the capability to move in the vertical and horizontal plane simultaneously. Mesa's UASs will be operated only in line of sight and only within a controlled area. Thus, insuring Mesa's UAS will not create a hazard to users of the national airspace system or the public. Given the small size of Mesa's UASs involved and the restricted controlled environment which Mesa's UASs will operate, Mesa 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 Mesa's UASs and the controlled areas in which Mesa's 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.

Mesa 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 Mesa agrees to be bound when conducting commercial operations under an FAA issued exemption include:

1. Mesa's UAS will weigh less than 55 pounds (25 kg).
2. Mesa's UAS will be operated at a speed of no more than 100 mph.
3. Flights will be operated within visual line of sight of a pilot.
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 a time.
6. Minimum crew for each operation will consist of Mesa's UAS Operator and a Visual Observer.
7. Mesa's UAS Operator will be Pilot in Command (PIC) with an FAA sports pilot's certificate or higher and shall have completed the required FAA training, UAS manufacturer training, and have a valid driver's license. The PIC will be trained in flight, operations, and safety procedures as detailed in the Flight Manual.
9. Mesa's 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 mandatory briefing will be conducted in regard to the planned UAS operations prior to each day's activities.
12. The operator will obtain 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.
14. PIC and VO will at all times be able to communicate by voice.
15. PIC will conduct preflight inspections to ensure Mesa's UAS is safe for operation.
16. Flights will be operated at an altitude less than 400 feet AGL.
17. Mesa's UAS will only operate in Class G airspace.
18. Any site within 5 miles of an airport will not be flown without notification and approval of the local FAA Flight Standards District Office (FSDO) and airport controller.
19. All required permissions and permits will be obtained from relevant property owners, territorial, state, county, or city jurisdictions, including local law enforcement, fire, or other appropriate governmental agencies.
20. If Mesa's UAS loses communication or GPS signal, it will have capability to return and land to a pre-determined location within the Security Perimeter.
21. Mesa's UAS will have the capability to abort a flight in case of unpredicted obstacles or emergencies.

The Relief Mesa's Seeks and the Reason for 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 Mesa's UAS to be utilized by Mesa, 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.

UASs operated by Mesa weigh 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 operate under the "blanket" 200-foot COA. In this case, an analysis of these criteria demonstrates that Mesa's UAS operated with 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. An exemption may be needed as Mesa's 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, Mesa 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 Mesa's 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, UAS's are 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 a UAS are diminished from the level of risk associated with commercial operations contemplated by Part 61, when drafted, that allowing operations of Mesa's 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. Check for no airworthiness

The regulation requires that no person may operate a civil aircraft unless it is in airworthy condition. Because airworthiness certificate has been issued for the aircraft, no FAA regulatory standard exists for determining airworthiness. Given the size of the aircraft and the requirements contained in the Petitioner's Operations Manual for the use of an inspection checklist 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. UAS's given their size and configuration, have 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 Mesa's UAS flight manual at the ground control point where the PIC operating Mesa's 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 Mesa's UAS, checking flight battery requirements, weather conditions, checking takeoff and landing distances, and all other actions in the User Guide and safety checklists providing 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 ft 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 Mesa proposes to operate its UASs below 400 ft AGL. As set forth herein, Mesa's UAS will operate below 400 ft AGL. An equivalent level of safety will be achieved given the size, weight, and speed of Mesa's UAS, as well as the location where it is operated. Mesa requests modification, waiver or exemption and/or clarification concerning the terms "congested areas" and "densely populated". Mesa requests waiver for this condition to allow reasonable and responsible operations with safety in areas of subdivisions and neighborhoods if required. Additionally, Mesa proposes to conduct flights on property owned by, or property under a utility easement that may lie in areas considered to be "congested". These flights will be hovering flights at or near zero ground speed, and at altitudes below 100' AGL. They will be conducted entirely over utility property or easements, and at an altitude and in a fashion that should a power unit fail, procedures that will ensure that it will not drift from utility property. The operations proposed by this exemption request require that operations be conducted in close proximity to structures. Under section (c), the Petitioner requests that no restrictions with regard to minimum distances from structures, vessels, and vehicles, and a 200-foot minimum distance from persons not associated with the operation be granted. Petitioner further requests that with regard to crew required for the operation of the UAS, *no* minimum distance be required. When inspecting spans of transmission line conductors, a mile long flight may be required. In order for the PIC to maintain the necessary spatial orientation and for the Visual Observer to assure situational awareness, the crew proposes to follow the UAV from a safe distance in a moving vehicle.

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 Mesa's 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 CFR 91.151(a) and (b) – Fuel requirements for flight in VFR conditions.

Unlike civil aircraft, the proposed UAS is battery-powered, not fuel powered. Therefore, the requirements under Section 91.151(a) are not applicable. The battery powering the UAS only has approximately 30 minutes of powered flight,

therefore an exemption from the 30-minute reserve requirement is necessary. Additionally, we are not planning, nor proposing to fly our UAS at night. Mesa proposes to provide an equivalent level of safety by employing telemetry that provides a constant indication of remaining power, along with a low-voltage visual and audible warning when the power gets critically low. In this event, the UAS can be landed safely within a minute or two while maintaining some power in reserve.

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. UAS's have no cabin or cockpit, there is no ability or place to carry certification and registration documents or to display these documents on Mesa's 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 Mesa's UAS will have immediate access to the documents, to the extent needed and applicable to Mesa's UAS.

14 CFR § 91.405(a) Maintenance required
This section requires periodic inspections, repairs made as necessary, and those procedures documented. Inspections will be performed before the first flight of each day and repairs completed in accordance with the AUS Operations Manual, thus assuring an equivalent level of safety.

14 CFR § 91.407 Operation after maintenance, preventive maintenance, rebuilding, or alteration
This section requires that after maintenance, proper entries be made in the aircraft record, and that necessary certain checks, including flight checks be performed. Flight checks will be performed prior to the first flight of the day in accordance with the AIS Operations Manual to ensure proper functionality of all systems and components.

14 CFR §91.409 – Inspections
This section requires that annual and 100-hour inspections be performed on certain aircraft, and that they be returned to service by properly authorized personnel. The petitioner asserts that the personnel that operate the UAS have received training on its proper care and maintenance, and are as qualified to determine that it is in condition for safe flight as the personnel authorized by 43.7, thereby achieving an equivalent level of safety.

14 CFR 91.417(a) & (b) – Maintenance records
This section describes requirements for maintenance recordkeeping. The Petitioner will maintain records of all inspections, maintenance, alterations, and repairs. They will be kept on site by the PIC and will be available to the Administrator or his representative.

Public Interest:
This exemption would allow Mesa to operate Unmanned Aircraft System ("UAS") to safely perform aerial inspections of elevated structures for our clients. The utility industries rely on accurate conditional assessments in order to make intelligent and timely decisions. This is vital and critical in order for utilities to continue to safely provide reliable energy to the nation's power grid and, consequently, enhance national security.

Mesa believes UAS's will allow our company to provide services more safely and effectively. UAS aircraft significantly improves public safety and reduces risks associated with using manned aircraft and helicopters. The public's interest is also advanced by reducing human exposure to death or serious injury associated with manned aircraft performing such services. Power industry inspections using UAS significantly enhance public safety compared to using manned aircraft. A

traditional aircraft flying at low levels or in populated areas puts the public at increased risks of harm. UAS's can fly safely in populated areas under controlled situations. Since UAS's are very small and do not carry combustible fuel, any potential explosion threat to the public is alleviated. By granting an exemption the FAA will fulfill Congress's intent of allowing UAS to operate with significant safety precautions in low risk environments.

The operation of small UAS in the strict conditions provides an equivalent higher 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 sterile environment and, as a result, are far safer than conventional manned aircraft operating with significant levels of fuel in close proximity to the ground and people. In addition, the environmental impact is reduced due to less noise and rotor wash from helicopters.

Privacy

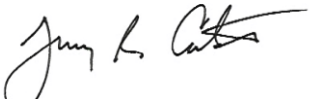
All flights will be conducted in accordance with any federal, state or local laws regarding privacy.

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; 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). 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.

Granting the requested exemption will benefit the public interest by significantly improving safety and reducing risk by alleviating human exposure to danger, and by reducing the environmental impact associated with manned aircraft.

Regards,



Tim Cutshaw
Executive Vice President
Mesa Associates, Inc.