



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

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

July 28, 2015

Exemption No. 12194
Regulatory Docket No. FAA-2015-1856

Mr. Jonathan Yarger
Member
HD Mapping, LLC.
P.O. Box 645
Tannersville, NY 12485

Dear Mr. Yarger:

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 HD Mapping, LLC. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct Aerial mapping, surveying, photography, filmmaking, inspections, and education and research.

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

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

Airworthiness Certification

The UAS proposed by the petitioner is a 3D Robotics X8-M.

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 collection¹. 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, HD Mapping, LLC. 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, HD Mapping, LLC. 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 3D Robotics X8–M 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.nts.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 July 31, 2017, unless sooner superseded or rescinded.

Sincerely,

/s/

John S. Duncan

Director, Flight Standards Service

Enclosures

U.S. Department of Transportation
Docket Management System
1200 New Jersey Ave., SE
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May 5th, 2015

HD Mapping, LLC.
Section 333 Petition to Operate
Small Unmanned Aerial Systems

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Petition Summary:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95 (2012), 126 Stat. 11 (“Section 333”) and the Federal Aviation Administration’s (“FAA”) general exemption authority under 49 U.S.C. section 44701(f), HD Mapping (“Petitioner”) hereby petitions for exemptions from 14 C.F.R Part 21, Subpart H (Airworthiness Certificates), 14 C.F.R. Part 27 (Airworthiness Standards: Normal Category Rotorcraft), 14 C.F.R sections 61.113(a)-(b), 91.103(b)(1), 91.119(c), 91.121, 91.151, 91.405(a), 91.407(a)(1), 91.409(a)(2), and 91.417(a)- (b).

The proposed exemption, if granted, would allow Petitioner to conduct commercial operations of small unmanned aircraft systems (“UAS”) meeting or exceeding all of the operational and safety requirements Congress has set forth in Section 333.

Statutory Authority

Section 333, titled “Special Rules for Certain Unmanned Aircraft Systems”, provides a mechanism for seeking expedited FAA authorization of safe civil UAS operations in the NAS. Section 333(a) states that the FAA “shall determine if certain unmanned aircraft systems may operate safely in the national airspace system before completion of the (comprehensive) plan and rulemaking required by section 332(b)(1) of this Act or the guidance required by section 334 of this Act.” In Section 332(b)(1), Congress made it clear that Section 333 provides a mechanism for “expedited operation authorization” if several factors are met. Petitioner meets all requirements to permit FAA approval of commercial UAS operations.

Characteristics of the Aircraft

The petitioner states that the unmanned aircraft (UA) to be operated under this request is less than 55 lbs. fully loaded, flies at a speed of no more than 50 knots, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a secured area as set out in the Operation Manual. The craft is the X8-M manufactured by 3D Robotics. The craft has a multi-copter design, GPS, full autonomous autopilot capabilities, telemetry, manual ground control and an on-screen-display/first-person-view system.

In addition, the craft has integrated safety features built into the design of the UAS, as described in the Operation Manual, to ensure the safety of persons and property within and surrounding the limited operating area. The petitioner further describes that, in the event the UAS loses communications or its GPS signal, the UA will have the capability to return to a pre-determined location within the Security Perimeter and land.

Applications

Petitioner is an aerial mapping company that plans to exploit the capabilities of Unmanned Aerial Systems to offer a multitude of services, including:

- Aerial surveying
- Aerial mapping
- Aerial filmmaking and photography
- Energy systems inspections and asset management
- Construction site inspections and monitoring
- Wildlife and forestry monitoring
- Educational and research operations
- Pipeline inspection and patrolling

The Petitioner Requests Relief From the Following:

HD Mapping requests an exemption from the following regulations as well as any additional regulations that may technically apply to the operation of the 3D Robotics X8-M:

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

Section 91.203 requires all civil aircraft to have a certificate of airworthiness. Part 21, Subpart H, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR § 91.203(a). Given the size of the X8-M, its very light weight (aircraft weight is 7.7 pounds, with additional capacity of 0.4 pounds) and the limited operating area associated with its utilization, it is unnecessary to go through the certificate of airworthiness process under Part 21 Subpart H in order to achieve or exceed current safety levels.

Such an exemption 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 both 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 UAS involved. An analysis of these different criteria demonstrates that the X8-M operated without an airworthiness certificate, under the conditions proposed in that exemption, will be at least as safe, or safer, than a conventional aircraft with an airworthiness certificate.

14 C.F.R. § 45.23 & 14 C.F.R. § 45.29: Display of marks; size of marks

These regulations provide that each aircraft must display "N" and the aircraft's registration number in letters at least 3 inches high. Additionally, the aircraft must display the word "EXPERIMENTAL" in letters at least 2 inches high near the entrance to the cabin, cockpit, or pilot station.

Given the size of the X8-M (aircraft dimension of 13.7 in x 20.1 in x 11.8 in), this requirement is impossible to match.

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

This regulation requires that no person may operate a civil aircraft unless it is in airworthy condition. Should the exemption be granted allowing commercial operation of the X8-M without an airworthiness certificate, no standard will exist for airworthiness of the X8-M. Given the size of the aircraft and the requirements contained in the User Guide for maintenance and use of safety checklists prior to each flight an equivalent level of safety will be provided.

14 C.F.R. § 91.9: Civil aircraft flight manual, marking, and placard requirements.

This regulation provides that no person may operate an aircraft unless a current, approved flight manual is in the aircraft. HD Mapping assumes that the intent of this requirement is to ensure that flight manual information is available to the aircrew while operating the aircraft. HD Mapping requests an exemption to this requirement since the aircraft is not only too small to carry documentation, the documentation would not be available to the crew.

The equivalent level of safety will be achieved by keeping a hard copy of the flight manual in the X8-M transportation box.

14 C.F.R. § 91.109(a) & 91.319(a)(1): Flight Instruction

Section 91.103 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.

By design, UAS and remotely piloted aircraft do not have fully functional dual controls. Flight control is accomplished through the use of a control box that communicates with the aircraft via radio communications. The equivalent level of safety is provided by the fact that neither a pilot nor passengers will be carried in the aircraft, the ability to control the UAS via radio signals from the controller and by the size and speed of the aircraft.

14 CFR § 91.119: Minimum Safe Altitudes

The regulation provides that over sparsely populated areas the aircraft cannot be operated closer than 500 feet to any person, vessel, vehicle, or structure. Since the aircraft will be operating at a maximum of 400 feet AGL, the X8-M cannot comply with this requirement.

The equivalent level of safety will be achieved because the X8-M will only fly over private property with the permission of the landowner. The operator will define before

every flight a working area radius and a flight area ceiling, preventing the X8-M to go beyond the flight area.

The landowner and the persons who may be on the ground in the flight area will be briefed of the expected route of flight and the associated risks to persons and property on the ground. Due to the small size of the X8-M and the material with which the X8-M is built, the hazard to persons, vessels, vehicles, and structures is not comparable to manned aircraft and should be considered in granting the exemption. Moreover, the aircraft will not be operated over congested areas or over any open- air assembly of persons. The aircraft will be operated at an altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

14 CFR 91.121 – Altimeter settings

This section requires that each person operating an aircraft shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to an altimeter that is set, when operating below 18,000 feet MSL to:

The current reported altimeter setting of a station along the route and within 100 nautical miles of the aircraft: If there is no station within the area prescribed in paragraph (a)(1)(i) of this section, the current reported altimeter setting of an appropriate available station; In the case of an aircraft not equipped with a radio, the elevation of the departure airport or an appropriate altimeter setting available before departure.

To provide an equivalent level of safety, the X8-M autopilot calculates the reference altitude (ground level) with the on-board GPS during the pre-flight tests. The GPS and barometer data are merged with respect to their respective precisions. The GPS provides reliable information to correct potential barometric bias, while rapid variations in altitude are detected through the barometer. Hence, barometric bias induced by environmental factors is rejected.

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

The regulation provides that no person may begin a flight in an airplane under day-VFR conditions unless there is enough fuel to fly to the first point of intended landing and to fly after that for at least 30 minutes.

Given the area of operation for the X8-M, HD Mapping believes that an equivalent level of safety is achieved with the low battery failsafe feature in which the X8-M will automatically land if the battery reaches below a determined point.

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

This regulation provides as follows:

No person may operate a civil aircraft unless it has an appropriate and current airworthiness certificate.

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 §91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

The X8-M weighs only 7.7 pounds. As such, there is no ability or place to carry certification and registration documents or to display them on the UAS. In addition, there is no pilot or passengers on board the aircraft.

To obtain an equivalent level of safety and meet the intent of 91.203, HD Mapping proposes that the documents deemed appropriate for this aircraft by the FAA will be co-located with the operator at the ground control station in the X8-M box and available for inspection upon request.

14 CFR Subpart E (91.401 - 91.417) - Maintenance, Preventive Maintenance, and Alterations

The regulation requires that the operator is primarily responsible for maintaining the aircraft in an airworthy condition, including compliance with Parts 39 and 43. Paragraphs 91.407 and 91.409 require that the aircraft be "approved for return to service by a person authorized under 43.7" after maintenance and inspection. Section 91.409(a)(2) requires an annual inspection for the issuance of an airworthiness certificate. Section 91.417(a) requires the owner or operator to keep records showing certain maintenance work that has been accomplished by certificated mechanics, under Part 43, or licensed pilots and records of approval of the aircraft for return to service.

HD Mapping proposes that the maintenance of the X8-M will be accomplished by the owner/operator according to the maintenance manual, provided by 3D Robotics.

An equivalent level of safety will be achieved because the X8-M is small in size. It is not a complex mechanical device, it will carry no external payload, and it will operate only in restricted predetermined areas. Moreover, the operator is the person most familiar with the aircraft and is best suited to maintain the aircraft in an airworthy condition and to ensure an equivalent level of safety. Finally, before every flight, the X8-M runs automatic sequences of pre-flight tests to make sure that every sensor and every critical part is running properly. Several parts of the X8-M are easily interchangeable (propellers, wings), which allows the operator to make sure the wings and propulsion system are always airworthy when a mission is initiated.

The Petitioner has Supplied the Following Additional Information:

X8-M Operation Manual.

Pre-flight Inspection, Maintenance

Before each flight, the Pilot In Command, will perform a series of pre-flight and takeoff checks as defined by the Operation Manual supplied. After every 60 minutes of airtime, the craft will undergo a thorough inspection of all aircraft components, including, but not limited to:

- a. Actuators / Servos
- b. Motors, wiring and connectors
- c. Propellers, smooth, no chips
- d. Electronic speed controller, wiring and connectors
- e. Batteries, wiring and connectors
- e. Remote command and control
- f. Ground control station

UAS Operating Parameters

The petitioner states that all flights will be operated within visual line of sight (VLOS) of the pilot. Daytime Visual Flight Rules and all operations will be conducted with the assistance of a second spotter/observer. The UAS flights will be limited to a maximum altitude of 400 feet AGL. Altitude is accurately measured by the GPS. The petitioner further states that an operator will ensure that only consenting production personnel will be allowed within 100 feet of the UA operation and UAS will be kept at least 100' from any inhabited structure. Generally, the petitioner's UAS will be operated in rural or suburban areas that will permit significantly larger safety zones.

Flight Standards District Offices (FSDOs) will be notified as required prior to operations to describe intended coordination for proposed operation(s). Petitioner will obtain an Air Traffic Organization ("ATO") issued Certificate of Waiver or Authorization ("COA") prior to conducting any operations under this grant of exemption. In fulfilling its requirements under the COA, Petitioner will be required to request a NOTAM no more than 72 hours in advance, but not less than 48 hours prior to the operation.

Petitioner's UAS will remain clear and yield the right of way to all manned operations and activities at all times (including, but not limited to, ultralight vehicles, parachute activities, parasailing activities, and hang gliders). Petitioner will not conduct UAS operations within 5 nautical miles of the geographic center of a non-towered airport unless a letter of agreement with that airport's management is obtained and the operation is conducted in accordance with a Notice to Airmen ("NOTAM").

Pilot in Command (PIC)

Subsections (a) and (b) of § 61.113 prohibit private pilots from operating aircraft in commercial operations and Section 61.133(a) requires an individual operating an aircraft

for compensation or hire to hold a commercial pilot certificate. The FAA has the statutory authority to waive the pilot requirements for commercial operations 49 U.S.C. § 44701(f). Basis for exemption is as follows: AV requests an exemption from 14 C.F.R. §§ 61.113(a) and (b) and 14 C.F.R. § 61.133(a) so that the X8-M may be operated by individuals who have a private pilot certificate.

Based upon the design features of the X8-M with its autopilot system and safety factors, the FAA should permit operation of UASs by operators with a private pilot certificate. The conditions described above are in line with those set forth in Volume 16, Chapter 4, Section 1 of FAA Order 8900.1. AV proposes to conduct operations in accordance with these restrictions. Given these conditions and restrictions, an equivalent level of safety will be provided by allowing operation of the X8-M with a private pilot certificate. The risks associated with the operation of the X8-M (given its size, speed, operational capabilities, and lack of combustible fuel) are much less than the level of risk associated with manned operations both private and commercial as contemplated by Part 61; that allowing operations of the X8-M, as set forth above, meets or exceeds the present level of safety provided under 14 C.F.R. §§ 61.113(a) & (b) and 61.133(a).

Radio Frequencies

The X8-M will use the 915Mhz frequency, which is allotted by the FCC for data transmission and vehicle control in unlicensed frequency bands. All devices used will comply with FCC usage and emissions regulations.

Safety and Benefits of the UAS

The petitioner will be using the UAS in a variety of applications that generally require expensive full-size manned aircraft to complete. Small, light and unmanned aerial vehicles offer a myriad of benefits over the use of full-sized manned aircraft such as for electric power line inspection, oil/gas pipeline inspection, and film and still photography. Manned aircraft that is carrying crew and flammable fuel is being replaced with small UAS carrying no passengers or crew creating a greater margin of safety for the pilots and crew.

By granting Petitioner's requested exemptions, the FAA will help drive development of safe and successful commercial UAS operations and will advance the public knowledge base for such operations. Petitioner is committed to promoting the UAS research efforts of policymakers including the FAA, NASA, DOD and DARPA by sharing data from its commercial UAS operations and serving as a resource for future UAS research operations. Thus, the FAA has good cause to grant this Petition.

Conclusion

For reasons stated, the exemptions requested herein should be granted and Petitioner should be permitted to conduct small UAS operations in accordance with its manuals and all other operating parameters deemed necessary and appropriate by the FAA.

Respectfully Submitted,

Jonathan Yarger
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