



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

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

June 30, 2015

Exemption No. 11947  
Regulatory Docket No. FAA-2015-1453

Mr. Daniel C. Augspurger  
1552 Progress Street  
North Liberty, IA 52317

Dear Mr. Augspurger:

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 April 20, 2015, you petitioned the Federal Aviation Administration (FAA) for an exemption. You requested to operate an unmanned aircraft system (UAS) to conduct aerial surveying, construction site inspection and monitoring, and photography/videography.

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 an Yuneec Typhoon Q500.

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<sup>1</sup>. 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, Mr. Daniel C. Augspurger is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

### **Conditions and Limitations**

In this grant of exemption, Mr. Daniel C. Augspurger is hereafter referred to as the operator.

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<sup>1</sup> 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.

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 Yuneec Typhoon Q500 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](http://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,

John S. Duncan  
Director, Flight Standards Service

Enclosures

April 20, 2015  
U. S. Department of Transportation  
Docket Management System  
1200 New Jersey Ave., SE  
Washington, DC 20590

Exemption Request Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations from 14 CFR Part 21; 61.113 (a) & (b); 91.7 (a); 91.9 (b) (2); 91.103(b); 91.109; 91.119; 91.121; 91.151(a); 91.203(a) & (b); 91.405(a); 91.407(a) (1); 91.409 (a) (2); 91.417 (a) & (b).

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11, Daniel C. Augspurger, operator of Unmanned Aircraft Systems ("UASs") equipped to offer on-demand commercial UAS operations for **aerial data collection** that involves aerial surveying, construction site inspection and monitoring, and real estate and marketing photography/videography, hereby applies for an exemption from the listed Federal Aviation Regulations ("FARs") to allow commercial operation of its microUAS, so long as such operations are conducted within and under the conditions outlined herein or as may be established by the FAA as required by Section 333.

As described in this document and the attached Flight Manual, the requested exemption would permit the operation of small, unmanned and relatively inexpensive UAS under controlled conditions in airspace that is 1) limited 2) predetermined 3) controlled as to access and 4) would provide safety enhancements to the already safe operations using conventional aircraft. Approval of this exemption would thereby enhance safety and fulfill the Secretary of Transportation's (the FAA Administrator's) responsibilities to "...establish requirements for the safe operation of such aircraft systems in the national airspace system." Section 333(c) of the Reform Act.

The name and address of the applicant is:

Daniel C. Augspurger  
1552 Progress St  
North Liberty, IA  
Ph: 319.333.9414  
Email: [daugs4@gmail.com](mailto:daugs4@gmail.com)  
FAA Certificate # 2840369 ATP

Daniel C. Augspurger is a professional pilot that makes his living flying corporate jets. He holds an Airline Transport Pilot's license with a first-class medical along with a Certified Flight Instructor Airplane (CFI) and Instrument Instructor (CFII) rating and has accumulated over 3500 hours of flight time. He has been flying professionally for 10 years and still makes occasional use of his CFI and CFII licenses in single engine aircraft.

Attachments to this exemption request include the Yuneec Q500 user manual and the Flight Manual which includes conditions and limitations of operations, checklists, and the maintenance log.



## **REGULATIONS FROM WHICH THE EXEMPTION IS REQUESTED:**

14 CFR Part 21  
14 CFR 61.113 (a) & (b)  
14 C.F.R. 91.7 (a)  
14 CFR 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 CFR 91.151 (a)  
14 CFR 91.203 (a) & (b)  
14 CFR 91.405 (a)  
14 CFR 407 (a) (1)  
14 CFR 409 (a) (2)  
14 CFR 417 (a) & (b)

## **STATUTORY AUTHORITY FOR EXEMPTIONS**

This exemption application is expressly submitted to fulfill Congress' goal in passing Section 333(a) through (c) of the Reform Act. This law directs the Secretary of Transportation to consider whether certain unmanned aircraft systems may operate safely in the national airspace system (NAS) before completion of the rulemaking required under Section 332 of the Reform Act. In making this determination, the Secretary is required to determine which types of UASs do not create a hazard to users of the NAS or the public or pose a threat to national security in light of the following:

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

Daniel C. Augspurger's microUAS are rotorcraft, weighing 4 or fewer lbs. including payload. They operate, under normal conditions at a speed of no more than 15 knots and have the capability to hover, and move in the vertical and horizontal plane simultaneously. They will operate only in line of sight and will operate only within a sterile area. Such operations will insure that the UAS will "not create a hazard to users of the national airspace system or the public." Reform Act Section 333 (b).

Given the small size of the UASs involved and the restricted sterile environment within which they will operate, the applicant falls squarely within that zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of UASs to commence immediately. Also due to the size of the UASs and the restricted areas in which the relevant UASs will operate, approval of the application presents no national security issue. Given the clear direction in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, as amended; the strong equivalent level of safety surrounding the proposed operations, and the significant 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 interest.

## **SPECIFIC AREAS THIS EXEMPTION WILL BENEFIT THE PUBLIC INTEREST:**

- Real Estate and Marketing Purposes (photography/videography).
  1. Aerial videography for geographical awareness and for real estate marketing has been around for a long time through manned fixed wing aircraft and helicopters. For small budget real estate companies and average homeowners the expense of such aerial videography is cost prohibitive.
  2. Only large companies or high-end realtors or luxury homeowners can afford to absorb the expense of manned aircraft videography. This deprives small budget real estate companies and the average homeowner of a very valuable marketing tool.
  3. Manned aircraft pose a threat to the public through potential catastrophic loss or crash of a large aircraft. Loaded with explosive hydrocarbon based fuel, a much larger risk is imposed on the general public than a small, less than 4 lbs, UA that is powered by a small battery.
  4. Daniel C. Augspurger will eliminate the above problems by offering the use of a small, ultra-light weight UA that is powered by a no emission battery and is very inexpensive to operate and own as compared to a large manned aircraft. This serves the public interest by making such operations safer and much more affordable.
- Construction Site Inspection and Monitoring
  - o The use of UA on a construction site can significantly reduce the risk to workers of falls while inspecting, surveying, or monitoring site progress. UAS can inspect, photograph, and collect data on hard to get to areas that otherwise would require worker inspection. Falls are a leading source of workplace fatality and injury on construction sites. Reducing falls through UAS use for site imaging could save workers lives.

## **UAS DESCRIPTION**

Daniel C. Augspurger intends to use and operate the Yuneec Q500 UAS multirotor aircraft. All operations will be predominately flown under 200 feet AGL. Aircraft are pre-programmed to not fly within 5 miles of an airport and will have an altitude limit of 400ft AGL.

These aircraft have fail safe features that include, but are not limited to geo fencing and lost link return to home/transmitter capability. This has been tested by the company as well as personally by turning off the transmitter simulating loss of GPS. The aircraft hovers in place, heads toward the transmitter's last location and will land if GPS signal is not recovered. In addition there are low voltage warning lights on the aircraft, and a low voltage warning vibration and alert on the personal ground station (controller/transmitter).

## **YUNEEC Q500 SPECIFICATIONS:**

- |  |                                 |
|--|---------------------------------|
| o Max Flight Time                      | 25 Minutes                      |
| o Dimension                            | 16.5x16.5x9.5in (420x420x240mm) |
| o Diagonal Length Without Rotor Blades | 22.2in (565mm)                  |
| o Propeller/Main Rotor Diameter        | 13.0in (330mm)                  |
| o Takeoff Weight                       | 60oz (1700g)                    |

○ Battery	5400mAh 3S 11.1V LiPo
○ Transmitter	10-channel 2.4GHz with 5.8GHz video downlink
○ 3 Flight Modes	Smart, Angle and Home Modes
○ Max Flying Height	Default 122m (400ft) Above Ground Level
○ Max Rotation Rate	65°/s
○ Max Roll Angle	35°
○ Radio Control Frequency Band	2.4GHz
○ Operating Temperature Range	– 5°C to 80°C
○ Max Climb Rate	3m/s
○ Max Descent Rate:	2m/s

#### FCC information:

“This product contains a radio transmitter with wireless technology which has been tested and found to be compliant with the applicable regulations governing a radio transmitter in the 2.400GHz to 2.4835GHz frequency range.

### AIRCRAFT AND EQUIVALENT LEVEL OF SAFETY

Daniel C. Augspurger proposes that the exemption requested herein apply to sUAS that have the characteristics and that operate with the limitations listed herein. These limitations provide for at least an equivalent or higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to the already safe operations conducted with conventional aircraft.

These Operation Limitations/Specifications and conditions to which Daniel C. Augspurger agrees to be bound when conducting commercial operations under an FAA issued exemption at a minimum include:

1. Operations are limited to the Yuneec Q500, 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.
3. The UA will not be operated at a speed exceeding 87 knots (100 miles per hour). Daniel C. Augspurger will 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 will be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude will be reported in feet AGL.
5. The UA will 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.

6. All operations will utilize a visual observer (VO). The UA will 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 will be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC will be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC will ensure that the VO can perform the duties required of the VO.
7. All flight crew members, including PIC and VO, will have an understanding of, and comply with, Title 14 Code of Federal Regulations, and/or Agency directives and regulations, applicable to the airspace where the UAS will operate. Specifically all flight crew members will receive training on the rules and responsibilities described in 14 CFR Part 91 Sections 91.111, 91.113 and 91.115 regarding cloud clearance, flight visibility and the pilot controller glossary, including standard ATC phraseology and communication.
7. All operating documents will be accessible during UA operations and made available to the Administrator upon request. Daniel C. Augspurger will track revisions of the operating procedures/limitations and present updated and revised documents to the Administrator or any law enforcement official upon request.
8. Any UA that has undergone maintenance or alterations that affect the UA operation or flight characteristics, e.g. replacement of a flight critical component, will undergo a functional test flight prior to conducting further operations. Functional test flights will only be conducted by a PIC with a VO and will remain at least 500 feet from other people. The functional test flight will 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 UA to ensure that it is in a condition for safe operation.
10. Prior to each flight, the PIC will conduct a pre-flight inspection and determine the UA is in a condition for safe flight. The pre-flight inspection will 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 UA is found to be in a condition for safe flight.
11. Daniel C. Augspurger will follow the UA manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components. All maintenance will be recorded in a maintenance log and kept with the operating documents at all times.
12. Each UA will comply with all manufacturer safety bulletins.

13. A PIC will hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC will also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Colombia, Puerto Rico, a territory, a possession, or the Federal government. The PIC will 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. Daniel C. Augspurger will not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UA in a manner consistent with these specifications, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. Prior to commercial operations, the PIC must have accumulated and logged, in a manner consistent with 14 CFR Section 61.51(b), a minimum of 25 hours of total time as a UAS pilot and at least 5 hours logged as a UAS PIC operating the make and model of the UAS to be utilized for operations under this requested exemption, and three takeoffs and landings in the preceding 90 days. 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 UA will be operated will 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 will operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.
15. UA operations will not be conducted during night, as defined in 14 CFR § 1.1. All operations will be conducted under visual meteorological conditions (VMC). Flights will not be conducted under special visual flight rules (SVFR).
16. The UA will 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 Daniel C. Augspurger. The letter of agreement with the airport management will be made available to the Administrator or any law enforcement official upon request.
17. An Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA) will be obtained prior to conducting any operation planning to occupy any airspace between 200ft AGL and 400ft AGL under this requested grant of exemption. Additionally, Daniel C. Augspurger will request a Notice to Airmen (NOTAM) not more than 72 hours, but not less than 48 hours prior to the operation.
17. The UA will 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 will return to the transmitter/predetermined location within the planned operating area.

19. The PIC will 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 UAS 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.
22. All aircraft operated by Daniel C. Augspurger will 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 will be as large as practicable.
23. Documents used by Daniel C. Augspurger to ensure the safe operation and flight of the UA and any documents required under 14 CFR §§ 91.9 and 91.203 will be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents will be made available to the Administrator or any law enforcement official upon request.
24. The UA will remain clear and give way to all manned aviation operations and activities at all times.
25. The UAS will not be operated by the PIC from any moving device or vehicle.
26. All Flight operations will 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 UAS and/or debris in the event of an accident. Daniel C. Augspurger will 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 UAS, 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 these specifications

27. All operations will 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 will be reported to the FAA's UAS Integration Office (AFS-80) within 24 hours. Accidents will be reported to the National Transportation Safety Board.

## **REGULATIONS FOR WHICH EXEMPTIONS ARE REQUESTED**

### **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 a private pilot's license rather than a commercial pilot's license to operate this small UAS. 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 the requirements included in the Operation Specifications exceeds that provided by a single individual holding a commercial pilot's certificate operating a conventional aircraft. The risks associated with the operation of the UAS are so 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 a private pilot as the PIC 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 aircraft, should this exemption be granted, no FAA regulatory standard will exist for determining airworthiness. Given the size of the aircraft and the requirements contained in the Operating Specifications for maintenance and the 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:

No person may operate a U.S.-registered civil aircraft ...

(2) For which an Airplane or Rotorcraft Flight Manual is not required by §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 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 flight manual/specifications at the ground control point where the pilot flying the UAS will have immediate access to it. The FAA has issued the following exemptions to this regulation: Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10167A, 10602, 32827, and 10700.

#### **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. As FAA approved rotorcraft flight manuals will not be provided for the aircraft an exemption will be needed. The PIC will take all actions including reviewing weather, flight battery requirements, landing and takeoff distances and aircraft performance data before initiation of flight.

#### **14 C.F.R. §91.109: 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. UASs and remotely piloted aircraft, by their design 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 FAA has approved exemptions for flight training without fully functional dual controls for a number of aircraft and for flight instruction in experimental aircraft. See Exemption Nos.5778K & 9862A. The equivalent level of safety will be achieved 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 (d) allows helicopters to be operated at less than the minimums prescribed, provided the person operating the helicopter complies with any route or altitudes prescribed for helicopters by the FAA. As this exemption is for a sUAS that is a helicopter and the exemption requests authority to operate at altitudes up to 400 AGL, an exemption may be needed to allow such operations. As set forth herein, The UAS will never operate at higher than 400 AGL. It will however be operated in a restricted area with security perimeter, where buildings and people will not be exposed to operations without their pre-obtained consent. The 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. No flight will be taken without the required permission of the property owner or local officials. Because of the advance notice to the property owner and participants in the aerial activity, all affected individuals will be aware of the planned flight operations. Compared to flight operations with aircraft or rotorcraft weighting far more than the maximum 55lbs. proposed herein and the lack of flammable fuel, any risk associated with these operations is far less than those presently presented with conventional aircraft operating at or below 500 AGL other industries. In addition, the low-altitude operations of the sUAS will ensure separation between these small UAS operations and the operations of conventional aircraft that must comply with Section 91.119.

#### **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." The sUAS will not have a barometric altimeter. However, the use of triangulation with a minimum of six satellites in use by its onboard GPS will be able to give accurate Height Above Ground Level (HAGL) measurements. Daniel C Augspurger believes that an equivalent level of safety can be achieved by the operator as the sUAS uses HAGL from its initialization/takeoff point.

#### **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.

The FAA has previously issued exemptions for fuel requirements in VFR conditions for sUAS aircraft. See exemptions 2689F, 5745, 10673, 10808 and 11138.

Daniel C. Augspurger believes an equivalent or higher level of safety can be obtained by terminating the flight prior to the following:

-Yuneec Typhoon Q500—25 minutes or 25% of battery life, whichever occurs first. The UAS has a second level of safety that is achieved through the use of an aircraft battery monitoring system. The aircraft system will alert the operator of low battery voltage through a vibration in the control station.

Daniel C. Augspurger will not operate at night in accordance with 14 CFR 1.1.

An equivalent level of safety will be achieved because these sUAS are limited in size, scope of operations, and shall only fly above approved privately owned and operated property at or below 400 feet HAGL, and does not bear the same risks associated with large manned aircraft and therefore should be exempt from this section's requirements.

#### **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 § 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 §91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew. The UAS fully loaded weighs no more than 55 lbs and is operated without an onboard pilot. As such, there is no ability or place to carry certification and registration documents or to display them on the sUAS.

An equivalent level of safety will be achieved by keeping these documents at the ground control point where the pilot flying the sUAS will have immediate access to them, to the extent they are applicable to the sUAS. The FAA has issued numerous exemptions to this regulation. A representative sample of other exceptions includes Exemption Nos. 9565, 9665, 9789, 9789A, 9797, 9797A, 9816A, and 10700.

#### **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.

Given that these sections and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply to the applicant. An equivalent level of safety will be achieved because these small 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 land immediately and will be operating from no higher than 400 feet AGL, with the vast majority of operations under 200 feet. As provided in this document and the Flight 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. Moreover, the operator is the person most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety.

## SUMMARY

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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. §§ 61.113( a) & (b); 91.7 (a); 91.9 (b) (2); 91.103(b); 91.109; 91.119; 91.121; 91.151(a); 91.203(a) and (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); and 91.417 (a) & (b) to operate commercially a small unmanned vehicle (less than 4lbs).

Approval of exemptions allowing commercial operations of sUASs, will enhance safety by reducing risk. Conventional operations, using jet or piston power aircraft, operate at extremely low altitudes just feet from the subjects being filmed and in extreme proximity to people and structures and present the risks associated with vehicles that weigh in the neighborhood of 4,000lbs, carrying large amounts of jet A or other fuel. Such aircraft must fly to and from the operational location. In contrast, a sUAS weighing fewer than 55 lbs. and powered by batteries eliminates virtually all of that risk given the reduced mass and lack of combustible fuel carried on board. The sUAS is carried to the operation site and not flown. The sUAS will carry no passengers or crew and, therefore, will not expose them to the risks associated with manned aircraft flights.

The operation of small UASs, weighing less than 55 lbs., conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting 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 operations conducted with turbine helicopters operating in close proximity to the ground and people.

## Privacy

All flights will occur over private or controlled access property with the property owner's prior consent and knowledge. The grant of this exemption request will provide improved safety in day VFR 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 the grant of the requested exemptions allowing commercial operation of the applicant's UAS.

Sincerely,



Daniel C. Augspurger

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