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

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

September 25, 2015

Exemption No. 13033
Regulatory Docket No. FAA−2015−2734

Mr. Daniel Swearson
Applications Engineer
CAD Technology Center, Inc.
8101 34th Avenue South, Suite 100
Bloomington, MN 55425

Dear Mr. Swearson:

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 June 12, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of CAD Technology Center, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography and data collection for the AEC industry.

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 DJI Phantom 2 Vision.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in

consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

You have requested to use a UAS for aerial data collection[1]. The FAA has issued grants of exemption in circumstances similar in all material respects to those presented in your petition. In Grants of Exemption Nos. 11062 to Astraeus Aerial (*see* Docket No. FAA−2014−0352), 11109 to Clayco, Inc. (*see* Docket No. FAA−2014−0507), 11112 to VDOS Global, LLC (*see* Docket No. FAA−2014−0382), and 11213 to Aeryon Labs, Inc. (*see* Docket No. FAA−2014−0642), the FAA found that the enhanced safety achieved using an unmanned aircraft (UA) with the specifications described by the petitioner and carrying no passengers or crew, rather than a manned aircraft of significantly greater proportions, carrying crew in addition to flammable fuel, gives the FAA good cause to find that the UAS operation enabled by this exemption is in the public interest.

Having reviewed your reasons for requesting an exemption, I find that—

- They are similar in all material respects to relief previously requested in Grant of Exemption Nos. 11062, 11109, 11112, and 11213;
- The reasons stated by the FAA for granting Exemption Nos. 11062, 11109, 11112, and 11213 also apply to the situation you present; and
- A grant of exemption is in the public interest.

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, CAD Technology Center, Inc.is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

[1] Aerial data collection includes any remote sensing and measuring by an instrument(s) aboard the UA. Examples include imagery (photography, video, infrared, etc.), electronic measurement (precision surveying, RF analysis, etc.), chemical measurement (particulate measurement, etc.), or any other gathering of data by instruments aboard the UA.

Conditions and Limitations

In this grant of exemption, CAD Technology Center, Inc.is hereafter referred to as the operator.

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

1. Operations authorized by this grant of exemption are limited to the DJI Phantom 2 Vision when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

2. Operations for the purpose of closed-set motion picture and television filming are not permitted.

3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.

4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude must be reported in feet AGL.

5. The UA must be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate or U.S. driver's license.

6. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. The VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents,

the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS−80) may be contacted if questions arise regarding updates or revisions to the operating documents.

8. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g., replacement of a flight critical component, must undergo a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.

9. The operator is responsible for maintaining and inspecting the UAS to ensure that it is in a condition for safe operation.

10. Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, e.g., inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.

11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.

12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.

13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.

16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.

17. The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.

18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.

19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.

20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.

21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The exemption holder may apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N−Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.

23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

24. The UA must remain clear and give way to all manned aviation operations and activities at all times.

25. The UAS may not be operated by the PIC from any moving device or vehicle.

26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
    a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and
    b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

    The PIC, VO, operator trainees or essential persons are not considered nonparticipating persons under this exemption.

27. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative. Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.

28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS−80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

If this exemption permits operations for the purpose of closed-set motion picture and television filming and production, the following additional conditions and limitations apply.

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.

30. At least 3 days before aerial filming, the operator of the UAS affected by this exemption must submit a written Plan of Activities to the local Flight Standards District Office (FSDO) with jurisdiction over the area of proposed filming. The 3-day notification may be waived with the concurrence of the FSDO. The plan of activities must include at least the following:
    a. Dates and times for all flights;
    b. Name and phone number of the operator for the UAS aerial filming conducted under this grant of exemption;
    c. Name and phone number of the person responsible for the on-scene operation of the UAS;
    d. Make, model, and serial or N−Number of UAS to be used;
    e. Name and certificate number of UAS PICs involved in the aerial filming;
    f. A statement that the operator has obtained permission from property owners and/or local officials to conduct the filming production event; the list of those who gave permission must be made available to the inspector upon request;
    g. Signature of exemption holder or representative; and
    h. A description of the flight activity, including maps or diagrams of any area, city, town, county, and/or state over which filming will be conducted and the altitudes essential to accomplish the operation.

31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

Unless otherwise specified in this grant of exemption, the UAS, the UAS PIC, and the UAS operations must comply with all applicable parts of 14 CFR including, but not limited to, parts 45, 47, 61, and 91.

This exemption terminates on September 30, 2017, unless sooner superseded or rescinded.

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

Enclosures

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US Department Of Transportation
Federal Aviation Administration
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June 12th, 2015

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012(the reform act) and CFR Part 11, CAD Technology Center, Inc. request to be exempted from the Federal Aviation Regulations (FAR) listed below so that CTC may operate UAS commercially in airspace regulated by the FAA., as long as such operations are conducted within and under the conditions outlined herein or as maybe established by the FAA as required by Section 333.

As air safety is of paramount importance, CTC has developed a highly structured safety flight manual for our pilot as well as observer. As recent as the new proposed FAA regulation released as of February of 2015, CTC intends to operate well within the most stringent proposal required to operate an unmanned aircraft in the National Airspace System (NAS). We are prepared to attend any required course of study, participate in flight evaluation and pay any required fee(s) that may be instituted. The PIC will take all actions including reviewing weather, battery requirements, landing and takeoff performance before initiating flight missions.

As described below, the requested exception would permit the operation of light weight UAS under controlled conditions for commercial use by a certified private pilot thereby enhancing safety and fulfilling the Secretary of Transportation's (the FAA Administrator's) responsibility to" establish requirements for safe operation of such aircraft systems in national airspace systems." Section 333(c), of the Reform Act.

CTC's UAS is an aircraft weighing less than 55 pounds including payload (The DJI Phantom 2 Vision Quad Copter). It operates at a speed less than 50 knots and has the capability to hover and move in the vertical and horizontal plane simultaneously. The UAS has an auto return to launch point when battery power is under 25%. The UAS will operate within the line of sight with in a protected flight area as described below and at 200 feet AGL or less with an observer located close at hand as to make voice communication possible.

CTC respectfully requests the grant of an exception to the following specific sections of the Title 14 Code of Federal regulations allowing it to operate lightweight UAS for commercial use, 14 CFR 21,

subpart H, 14 CFR 45.23 (b) 14 CFR 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)&(b).

CTC submits this application in accordance with the Reform Act ,112 P.L. 95 331-334, seeking relief from any currently applicable FAR'S operating to prevent CTCs future commercial use of small UAS to operate in the national airspace system as described below. The reform Act section 332 provides for such integration of civil unmanned aircraft into our national airspace system as it is in the public's interest to do so. CTC's UAS meets the definition of a "small unmanned aircraft" as defined in Section 331 and therefor the integration of the UAS are expressly contemplated by the Reform Act. CTC would like to operate its light weight UAS prior to the time period by which the Reform Act requires the FAA to promulgate rules governing such aircraft.

The Reform Act directs the Secretary of Transportation to consider whether certain unmanned aircraft systems may operate safely in national airspace before completion of the rule making required under Section 332 of the reform Act. In making this determination, the Secretary of Transportation is required to determine which UASs do create a hazard to users of the national airspace system or the public or pose a threat to national security in light of the following:

The UAS size, speed, weight and operational capability

Operation of the UAS in close proximity to airports and populated areas

Operation of the UAS within visual line of sight of the operator

Reform Act 333(a). If the secretary determines that such vehicles "may operate safely in National Airspace System, the secretary shall establish requirements for the safe operation in national airspace.

Given the clear direction given in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, as amended, the strong equivalent level of enhanced safety, reduced emissions utilizing UAS verses traditional aircraft as well as the economic impact of greatly reducing the cost of aerial photography thereby benefiting the greater public's interest. Accordingly, the applicant requests that the FAA grant the requested exemption without delay.

The following will be considered as the binding limitation on operations of CTC:

1. Flights will only occur in the day time hours
2. Flights will be operated in the line of sight of the operator (PIC) and Observer (VSO)
3. Flights will be terminated at any time weather and wind deteriorate to "unsafe for flight" by manufacturers recommendations
4. The UAS will weigh less that 55 lbs.

5. Flights will be operated at 200 feet AGL or less
6. Crew will be at a minimum of operator(PIC) and an observer and/or camera operator(VSO)
7. Operator and crew will remain in contact during the flight operation
8. The UAS operator will perform a check of the flight area and make certain of the safety of all persons in the area
9. Consent will be obtained from all persons with in the video capabilities of the units to further reduce the chance of violating anyone's privacy
10. All required FAA clearances, will be obtained and distances from airports strictly observed
11. All UASs will have the capability to return automatically to the operator in a safe manner with the auto return function checked and working
12. When operated in conjunction with fishing vessels in the gulf, a chase boat will be assigned to operate the UASs at a safe distance from the main fishing boat
13. Flights will only operate in VFR conditions
14. UAS has a function on the control to tell the operator the distance away from the operator and its battery power remaining
15. Flight team will communicate by voice and the use of two-way radio if the area is too big to hear voice from all team members
16. UAS will be used for data collection for the AEC industry
17. When operating over or near water the UAS will be equipped with flotation devices so that recovery can be made as to prevent lithium battery exposure to the water table

14 CFR part 21 Subpart H: Airworthiness Certificate 14 CFR 91.7(a), 91.203(a)(1)

Subpart H, entitled Airworthiness Certificates, sets forth requirements for procurement of necessary certificates in relation to FAR 91.203(a)(1). The size, weight and defined area of operations for CTC's UAS flights permits exception from Part 21 because they meet an equivalent level of safety pursuant to Section 333 of the Reform Act. The FAA is authorized to exempt aircraft from the airworthiness certificate requirement under both the Act (49 USC 4470(f) and Section 333 of the Reform Act.

As of March 23, 2015 the FAA has stated that it will automatically grant a "blanket" COA for flights at or under 200 AGL to any UASs operator with a section 333 exemption.

14 CFR 91.203(a&b) provides for carrying of civil aircraft certifications and registrations. These are inapplicable for the same reasons stated above. The equivalent level of safety will be achieved by maintaining such certifications and registrations at CTC.

14CFR91.7 (a) prohibits the operation of an aircraft without an airworthiness certificate. As no such certificate will be applicable in the form contemplated by FAR's this regulation is inapplicable.

14 CFR 91.9(b)(2) Civil Aircraft Flight Manual in Aircraft requires an aircraft flight manual in the aircraft. As there are no pilots or passengers, and given the size of the UAS this regulation is

inapplicable. An equivalent level of safety will be achieved by maintaining such certifications and registrations at CTC.

The FAA has previously issued exemptions to this regulation in Exemptions No's 8607,8737,8738,9299,9299A,9565,9565B,10167,10167A,10602,10700 and 32827.

14 CFR 91.119 Minimum safe altitudes, prescribes safe altitudes for operation of civil aircraft. CTC will only operate its UAS at or below 200AGL. Compared to flight operations of conventional and traditional aircraft weighing far more than 50 lbs., operating below 500 AGL with flammable fuel UAS operations present a far smaller risk to the public.

Approval of these 333 Exemptions allowing commercial operations of small UAS in the service of aerial photography will greatly enhance safety by reducing the overall risk associated with traditional aircraft. Traditional aerial photography requires large aircraft with flammable fuel to fly in close proximity of populated areas and people in general. With the use of small UAS the risk of injury of people on the ground or the crew has been reduced or almost erased.

CTC respectfully requests the FAA grant its exception without delay. The FAA has the authority to issue the exemption sought by CTC pursuant to the Federal Aviation Act, 85 P.L. 726 (1958) as amended (the ACT). Thank you for your time in reviewing this information, please feel free to contact us with any questions or concerns about this petition.

Sincerely,

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