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

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

August 19, 2015

Exemption No. 12508
Regulatory Docket No. FAA−2015−1584

Mr. Rick L. Young
Castle Rock Fire and Rescue Department
300 Perry Street
Castle Rock, CO 80104

Dear Mr. Young:

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 29, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Castle Rock Fire and Rescue Department (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography and evaluation of emergency response scenes and operations.

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, Mr. Rick L. Young / Castle Rock Fire and Rescue Department 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, Castle Rock Fire and Rescue Department 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 August 31, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

April 29, 2015

U.S. Department of Transportation, Docket
Operations West Building Ground Floor, Room
w12-140
1200 New Jersey Avenue, SE Washington, DC 20590

Subj: *Petition for Exemption to Operate the DJI Phantom 2 Quad-Copter Unmanned Aerial System for official government aerial photography and evaluation of emergency response scenes and operations. Castle Rock Fire and Rescue Department is tasked under Colorado Revised Statute (CRS) 32-1-1002 with the responsibility of emergency response, fire suppression and investigation into the origin, cause and circumstances of every fire / explosion incident within our response area. Further the fire department responds to a wide variety of emergency related fire, rescue and medical responses each year. The use of the unmanned aerial system (UAS) provides the fire department with an aerial perspective of these incident scenes that cannot be obtained from the ground, and provides an additional tool that has proven useful in the management and mitigation of emergency incidents. The types of uses the fire department will utilize the UAS for will include, but not limited to: aerial photography of fire / arson / hazmat or other related investigation scenes to better document the area for the investigation and subsequent court presentations, aerial photography and live feed of active emergency incidents to the on-scene incident commander(s) to allow better deployment of resources on the ground, aerial photography of new construction developments within our jurisdiction to aid in the development of response strategies and mapping capabilities. The UAS technology can easily access hazardous materials response areas to capture and feed images to the on-scene incident commanders. These images can clearly identify the possible hazardous chemicals present, and provide excellent information leading to the successful mitigation of life threatening responses. As a former FBI Explosive Technician Rick L. Young also can realize a benefit of the unmanned aerial technology to provide post explosion blast photography and evaluation of these types of scenes where on the ground technology cannot provide the benefits. All uses of the UAS will be part of the on-scene incident management system used during responses.*

Dear Sir or Madam:

The purpose of this letter is to petition the Federal Aviation Administration for an exemption from certain Federal Aviation Regulations in order for the petitioner, Castle Rock Fire and Rescue Department – Rick L. Young, to operate an Unmanned Aerial System (UAS) within the jurisdictional response area of Castle Rock Fire and Rescue, and automatic aid response areas, in furtherance of our abilities to provide the highest quality emergency fire and life safety response service to our community.

Rick L. Young, and Castle Rock Fire and Rescue Department are well acquainted with the risks that come with the privilege of operating an unmanned aerial system in the United States, but also with the opportunities available via new unmanned flight technology we have already demonstrated that this tool will aid in the response efforts of those combatting emergencies.

Rick L. Young has logged over 100 hours of flight time on single-engine fixed wing unmanned remote control aircraft, and over 300 hours on unmanned remote control rotor aircraft. Rick L. Young also has more than 60 hours of flight time with the DJI Phantom 2 Quad-Copter UAS unmanned aircraft that is the subject of this Petition.

As a 38 year veteran of fire and law enforcement, the petitioner would like to combine the benefits of an unmanned aviation platform with his profession as an emergency responder to further the opportunities for enhancing the safety of the responders, ability to evaluate emergency scenes from another perspective and provide aerial imaging services during emergency responses for the safety of the public at large.

Accordingly, and pursuant to 14 CFR §§ 11.61-.103 and Section 333 of the FAA Modernization and Reform Act of 2012, PL 112-95 (Feb. 14, 2012), the petitioner is submitting the following information with this request:

Identity of Petitioner.

Petitioner: Rick L. Young / Castle Rock Fire and Rescue Department
300 Perry Street - Castle Rock, CO 80104
(303)660-1066
ryoung@crgov.com

Description of Operations.

A. <u>The UAS that is the Subject of this Petition.</u>

Rick L. Young is the owner / operator of a UAS DJI Phantom 2 Aerial Kit unmanned aircraft, and its associated portable ground station controller (together the "Subject UAS"). The subject UAS is a quad-copter with a GoPro camera mounted beneath it, piloted via a portable ground station. It has an empty weight of approximately 1,000 grams, and a maximum weight of 1,390 grams, with the GoPro Hero IV mounted as payload. The UAS was purchased in January 2015. The Phantom 2 is a widely known unmanned aircraft, and is the same type of aircraft that was recently the subject of numerous grants of exemption by the FAA. *See In re Douglas Trudeau,* FAA Exemption No. 11138 (Jan. 5, 2015).

The portable ground station used to pilot the unmanned aircraft is a two-channel, wireless communication device using an FCC-compliant 5.8GHz frequency band for the video link, and a 2.4 GHz transmitted. The subject UAS is equipped with lost-link capability, which enables the Phantom 2 to enter a fail-safe Return-to-Home Mode in the event that the link between the aircraft and the ground station is lost.

The subject UAS can operate for a total of approximately 20 minutes on one battery charge. It has a maximum range from the ground station of 2,300 feet. However, it also has programmable height and radius limits to establish an operations area. Without programming the subject UAS, it has a default height limit of 393 feet AGL.

In the case of Castle Rock Fire and Rescue the UAS will not exceed the 200 foot ceiling as noted in the March 23, 2015 determination by FAA to grant a "Blanket" COA for these types of flights. The jurisdiction in which Castle Rock Fire and Rescue operates also meets all the other criteria for the "blanket" COA.

B. <u>The UAS Pilot in Command.</u>

Mr. Rick L. Young began flying remote control aircraft in the early 1980's. As noted above Rick L. Young has 400+ hours of accumulated flight time.

Mr. Rick L. Young has never been subject to an FAA enforcement action.

C. UAS Operating Parameters and Intended Mission Profile.

Mr. Rick L. Young is a 38 year career law enforcement and fire technician who is a Certified Colorado Peace Officer, with over 25 years career and reserve service. I have attended the National Fire Academy classes on Fire and Arson Investigation, Fire Code Management, Hazardous Materials, and other related programs. Since 1981, I have attended in excess of 80 hours of training per year dedicated toward investigation of Fire, Explosion and Hazardous Materials scene investigations; fire cause and origin, Fire Prevention, interview and interrogation. I have instructed for the National Fire Academy, Red Rocks Community College, and for the State of Colorado in Fire, Arson, Explosives, law enforcement related classes and Hazardous Materials. I am a certified Hazardous Materials Technician / Specialist, and also possess an instructor's credential in the field. I attended the (FBI) Federal Bureau of Investigation four week Explosive Technician (Bomb Tech) School and received a Certification as an Explosives Expert. I served as a bomb technician with the Arapahoe County Sheriff's Office Bomb Squad for a period of 12 years. Until June 2002, I was an FBI Certified Bomb Technician, and remain an active member of the International Association of Bomb Technicians and Investigators (IABTI). I have testified numerous times in County, State and Federal Court as an expert in fire and explosion investigation, hazardous materials, code enforcement and other related subject areas. I am employed as Fire Prevention Officer / Investigator with the Castle Rock Fire and Rescue Department. I am a Colorado P.O.S.T. Certified Peace Officer in the State of Colorado and meet the required training hours as required by CRS 16-2.5-109 through the fire Department.

AIRCRAFT AND EQUIVALENT LEVEL OF SAFETY

Rick L. Young proposes that the exemption requested herein apply to civil aircraft that have the characteristics and that operate with the limitations listed herein. These limitations provide for at least an equivalent or even higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to operations that would be conducted with conventional aircraft. These conditions are drawn from Exemptions 11062 through 11067, 11080, 11109, and 11110.

These limitations and conditions to which Rick L. Young ("Operator") agrees to be bound when conducting UAS operations under an FAA issued exemption include:

1. All operations will be conducted below 200' AGL, and within a radius distance of 800' from the portable ground station.

2. Each operation will consist of one flight not greater than 20 minutes in duration under the authorization of the emergency incident commander.

3. A fixed location will be determined for the portable ground station as approved by the Incident Commander in charge of the response in progress.

4. Mr. Rick L. Young will act as the pilot in command and will have direct line of sight visual observation of the aircraft at all times, and operate only within visual line of sight. He will conduct all operations under his own personal and flight safety protocols from his control station.

5. In terms of proximity to the scene or structures being photographed, Mr. Rick L. Young may operate in a close proximity to the scene, and in some cases as close as 25' away from the scene. When that happens, he will operate at less than two miles per hour, making the risk of collision negligible.

6. Prior to the start of a flight, Mr. Rick L. Young will activate and use the UAS's global positioning system flight safety procedure and lost-link procedure to ensure return of the aircraft in the event of a lost link or compromised communication.

7. On each mission, the aircraft will return to the control pad with no less than five minutes of battery power remaining.

8. Each mission will last for no more than twenty minutes of flight time.

9. No missions will ever occur within the airspace of a specific airport or controlled airspace, in fact in most cases the airspace above these types of emergencies is restricted due to the nature of the emergencies.

10. All flights will occur during permissible weather conditions, and during hours where ambient light is present.

THE APPLICABLE LEGAL STANDARD UNDER SECTION 333

Rick L. Young submits that granting of this exemption application for use of the UAS in emergency and not-for-profit operations will advance the Congressional mandate in Section 333 of the Reform Act to accelerate the introduction of UASs into the NAS if it can be accomplished safely. This law directs the Secretary of Transportation to consider whether certain UASs may operate safely in the NAS before completion of the rulemaking required under Section 332 of the Reform Act. In making this determination, the Secretary was 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.

Reform Act § 333(a)(1). If the Secretary determines that such vehicles "may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft in the national airspace system." *Id.* § 333(c) (emphasis added).

The Federal Aviation Act expressly grants the FAA the authority to issue exemptions. This statutory authority, by its terms, includes exempting civil aircraft, as the term is defined under § 40101 of the Act, from the requirement that all civil aircraft must have a current airworthiness certificate and those regulations requiring commercial pilots to operate aircraft in commercial service:

> The Administrator may grant an exemption from a requirement of a regulation prescribed under subsection (a) or (b) of this section or any of Sections 44702-44716 of this title if the Administrator finds the exemption is in the public interest.

The grant of the requested exemption is in the public interest based on the clear direction in Section 333 of the Reform Act; the additional authority 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 and cost savings associated with transitioning to UASs for aerial surveying.

Accordingly, the applicant respectfully requests that the FAA grant the requested exemption without delay.

Specific Sections of 14 CFR From Which Petitioner Seeks an Exemption.

Petitioner, Rick L. Young, pursuant to the provisions of the Federal Aviation Regulations (14 C.F.R. § 11.61) and the FAA Modernization and Reform Act of 2012 (FMRA), Section 333, *Special Rules for Certain Unmanned Aircraft Systems*, hereby petitions the Administrator to commercially operate the DJI Phantom 2 Vision UAS in the National Airspace System (NAS), and for an exemption from the requirements of:

14 CFR Part 21, Subpart H	Certification procedures for products and parts, Airworthiness
14 CFR Part 36	Noise standards: Type and airworthiness
14 CFR § 45.23	Display of marks; general
14 CFR Part 61	Certification: Pilots, flight instructors, and ground instructors
14 CFR § 91.7	Civil aircraft airworthiness
14 CFR § 91.9	Civil aircraft flight manual, marking, and placard requirements
14 CFR § 91.103	Preflight action
14 CFR § 91.105	Flight crewmembers at stations
14 CFR § 91.109	Flight instruction
14 CFR § 91.119	Minimum safe altitudes
14 CFR § 91.121	Altimeter settings
14 CFR § 91.151	Fuel requirements for flights in VFR conditions
14 CFR § 91.173	ATC clearance and flight plan in IFR conditions
14 CFR § 91.203	Civil aircraft: Certifications required
14 CFR § 91.207	Emergency locator transmitters
14 CFR Part 91, Subpart E	Maintenance

The Extent of Relief Sought, and Reasons for Seeking the Exemption.

In consideration of the speed, weight, size, and limited operating area associated with the unmanned aircraft and its operation, Rick L. Young's operation of DJI Phantom 2 Vision+ UAS meets the conditions of FMRA Section 333 and therefore, will not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H. Accordingly, Rick L. Young requests relief from Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b), as these sections set forth requirements for maintenance that only apply to aircraft with an airworthiness certificate.

Rick L. Young submits that the requested relief is proper since an equivalent level of safety will be ensured. Rick L. Young will use experienced personnel or technicians to perform maintenance, alterations, or preventive maintenance on the UASs using the methods, techniques, and practices prescribed in the operating documents (i.e., Monthly Maintenance Log, and DJI Phantom 2 Vision+ Instruction Manual). Furthermore Rick L. Young will document and maintain all maintenance records for the DJI Phantom 2 Vision+ UAS.

14 CFR Part 21, Subpart H. Part 21 establishes the procedures for issuance of certificates of airworthiness, as mandated by 49 U.S.C. § 44704. Under Section 333 and 49 U.S.C. § 44701(b), the FAA may exempt aircraft from airworthiness certification. The petitioner requests an exemption from the requirements of this Part because the size, weight, speed, operational capability and proximity to airports in which the Subject UAS pose significantly less of a risk that the risks posed by conventional aircraft. Manned aircraft pose risks to the life and safety of the crew; that is not a consideration with the Subject UAS. Risks to third parties are also minimized given the lightweight and slow speed at which the Subject UAS would operate. Nor are there risks of fuel spillage or fire in the event of an accident. Thus Mr. Rick L. Young requests that the FAA waive the requirement that the Subject UAS, particularly the aircraft portion, require an airworthiness certificate.

14 CFR Part 36. FAR Part 36, Subparts A, F and 0, establish certain noise standards for certification of various aircraft types. Because the Subject UAS would not have an airworthiness certificate, and given its small size and negligible noise impact, the petitioner requests an exemption from FAR Part 36.

14 CFR § 45.23. FAR Part 45.23 establishes marking requirements for aircraft; paragraph (b) mandates that the registration number be displayed in letters not less than two inches in height. The Subject UAS is small enough that it cannot accommodate the type-size requirement. Accordingly, Mr. Rick L. Young requests an exemption from this part.

14 CFR Part 61. FAR Part 61 sets forth the certification requirements for pilots. Subpart E establishes the privileges and limitations for holders of a private pilot certificate. The petitioner requests an exemption that would allow him to operate the Subject UAS for compensation or hire for the reasons articulated in *In re Trudeau,* FAA Exemption No. 11138, and *In re Astraeus,* FAA Exemption No. 11062. Mr. Rick L. Young will operate the Subject UAS over property where the emergency response entity has emergency control in accordance with Colorado Revised Statutes to control. Furthermore, Mr. Rick L. Young meets the knowledge base and skill level for operating an UAS. He thus requests and exemption from the requirement that he hold a commercial pilot certificate.

14 CFR § 91.7. Under FAR 91.7, no person may operate an aircraft unless it is in an airworthy condition. To the extent that "airworthy" is defined as requiring an airworthiness certificate, the petitioner would request an exemption from this FAR for the same reasons identified in his request for an exemption of 14 CFR Part 21, Subpart H. Rick L. Young will not, however, operate the Subject UAS if it is not in a condition for safe flight, as required under FAR 91.7(b).

14 CFR § 91.9. Petitioner requests exemption from the requirement of FAR 91.9, which requires that all aircraft have certain markings, placards and on-board flight manuals for the same reasons as stated in his request fro exemption under 14 CFR Part 21, Subpart H, and for a deviation from the marking requirements of 14 CFR Part 36, Subparts A, F, and 0.

14 CFR § 91.103. FAR 91.103 mandates certain pre-flight action. Rick L. Young will take all necessary pre-flight action, but requests an exemption from this requirement insofar as it is interpreted as requiring pre-flight actions appropriate to manned aircraft only (e.g., that flights be from an airport, etc.).

14 CFR § 91.105. FAR 91.105 mandates that crewmembers be at designated stations, have safety belts fastened, etc. Rick L. Young would be at a designated ground station for each mission, but requests an exemption to accommodate the fact that the Subject UAS is unmanned.

14 CFR *§* 91.109. This FAR requires that all flight instruction be conducted in aircraft that have dual controls, or throw-over controls, with an instructor. From time to time the Rick L. Young will conduct his own refresher training, but requests an exemption insofar as this FAR would be interpreted to require that the ground control station have a second controller or dual- control capability.

14 CFR *§* 91.119. FAR 91.119 sets forth the minimum safe altitudes over various areas. Rick L. Young requests an exemption from this this FAR in order to accomplish the intended function of the mission for which he seeks an exemption.

14 CFR § 91.121. FAR 91.121 mandates various altimeter settings in order to maintain level flight. Rick L. Young requests and exemption from this FAR as the Subject UAV will not have an altimeter that matches the requirements of this FAR. Operations with the Subject UAV will, however, maintain altitude below the 200' AGL ceiling by Rick L. Young monitoring the altitude of the UAS and through the subject UAS's ability to establish a flight zone that cannot exceed the ceiling.

14 CFR § 91.151. Rick L. Young requests an exemption from the VFR-flight fuel carrying requirements because the Subject UAS will operate on battery power. Operations with the Subject UAS will, however, maintain a five-minute reserve battery time.

19 CFR § 91.173. Rick L. Young requests an exemption from the FR-clearance requirement for flights into controlled airspace. It is possible Rick L. Young may operate the Subject UAS in conditions where controlled airspace has been restricted by the Incident Commanders controlling the emergency response operations, however the use of the UAS will be instrumental in their ability to manage the incident and would require flight in the restricted commercial airspace. All operations will be conducted with complete and unfettered line of sight visibility with the Subject UAS.

14 CFR § 91.203. FAR 91.203 requires that a civil aircraft have an airworthiness certificate and a registration certificate. Rick L. Young requests that he be exempt from complying with this FAR insofar as it mandates issuance of an airworthiness certificate, for the reasons stated in his request for an exemption under 14 CFR Part 21, Subpart H.

14 CFR § 91.207. FAR 91.207 prohibits operation of a US-registered aircraft unless it is equipped with an emergency locator transmitter. Given the limited distance of flights of the Subject UAS, Rick L. Young requests and exemption from this FAR.

14 CFR Part 91, Subpart E. FAR 91, Subpart E requires that owners or operators of aircraft have the aircraft inspected at certain intervals, and by certain mechanics. Rick L. Young requests an exemption from this Subpart because the Subject UAS has a trouble-shooting and maintenance program that is best executed by the owner/operator, and is simply different from the maintenance of manned aircraft. Rick L. Young will, however, maintain a maintenance log and any maintenance records of repair of the Subject UAS.

Public Interest and Benefit Considerations.

Aerial imaging of emergency response incidents generally require use of a manned platform which poses an increased life safety concern. Close-proximity aerial photography is difficult to do with a manned platform, and usually requires the use of a helicopter or slow-moving aircraft at an appropriate distance over a populated area. The operation must be conducted in VFR conditions, and adds aircraft in congested airspace.

By using the subject UAS, Rick L. Young aims to provide the emergency responders and incident commanders with quality aerial photography at a fraction of the cost and risk involved with manned flight. Furthermore, the risks inherent with manned flight are significantly reduced where the aircraft conducting the operation is less than five pounds, remains below 200' AGL, and can operate within a very confined cylinder on or directly over the location being photographed. Finally, Rick L. Young has the knowledge and experience to conduct a safe, efficient flight operation in furtherance of his primary occupation as a public safety employee. Thus the public will be better served by having more affordable aerial option available, and through an operation that is being conducted by a qualified individual.

Why the Exemptions Would Not Adversely Affect Safety.

The proposed operations will not adversely affect safety for five primary reasons.

First, the operations will be conducted in airspace where there is typically no activity among other users of the NAS. Flights are limited to property over which the emergency response entity, incident commanders have requested that the subject UAS operate, so the incident commanders will be aware of the flight operation. Rick L. Young fully recognizes the dangers that a small UAV could pose to all types of manned aircraft. The operations he is proposing to undertake pending approval of this Exemption Request are operations where manned aircraft will not fly, or in the case that firefighting aircraft are being utilized the incident commander will have complete control over which aircraft are operating in the airspace. There would be a rigid separation between where a manned aircraft can fly (particularly due to FAR 91.119 which establishes minimum safe altitudes, to include an absolute prohibition of operating an aircraft within 500' of any structure) and where Rick L. Young would operate the UAV.

Second, the subject UAS is simply not a large aircraft. Weighing in at a maximum of five pounds fully loaded, the likelihood that it would damage property or injure a person is not low, even in the event of a mishap. Furthermore, aerial imaging is still something done via manned aircraft, and the risk there is at least equal to the risk posed by the proposed operation.

Third, the subject UAS has inherent lost-link capabilities to bring it back to its operating base for each mission. It is a redundant system for a more foreseeable problem that could arise.

Fourth, the subject UAS will be operated only by the petitioner, Rick L. Young has sufficient flight time and experience with the UAS aircraft to conduct a safe operation.

Fifth, the subject UAS will be operated only under the approval of the emergency scene incident commander where safety of emergency responders on the ground can be controlled.

Language for Inclusion in the Federal Register.

Rick L. Young proposes that the following language be included in the Federal Register:

> *Petition for Exemption.*
>
> *Federal Aviation Regulations from which Petitioner seeks exemption: 14 CFR 14 CFR Part 21, Subpart H; Part 36; § 45.23; Part 61; §§ 91.7; 91.9; 91.103; 91.105; 91.109; 91.119; 91.121; 91.151; 91.173; 91.203; 91.207; and 14 CFR Part 91, Subpart E.*
>
> *Description of Relief Sought: The petitioner is seeking an exemption from the above-referenced Federal Aviation Regulations to conduct aerial photography using a light, unmanned aerial vehicle for emergency response entities and incident commanders seeking to provide aerial images of emergency incident scenes being managed within the response area.*

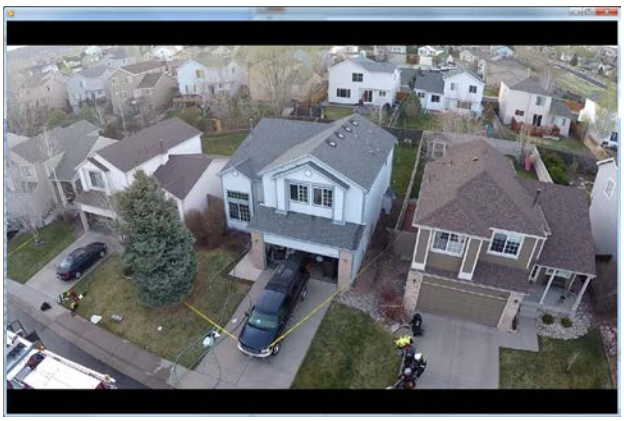
Conclusion.

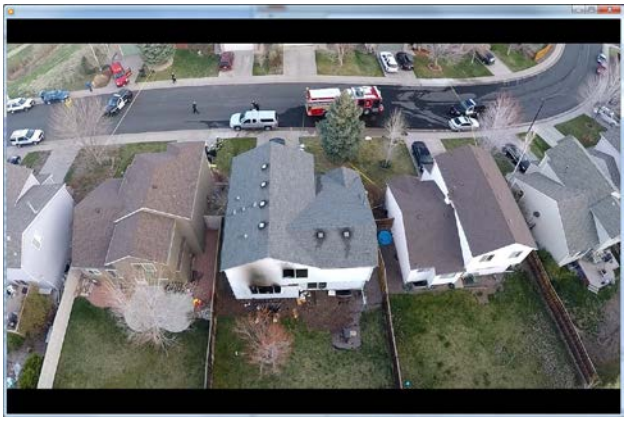
Rick L. Young thanks the FAA for considering this request. Please do not hesitate to contact me should there be a need for additional information. I look forward to working with the FAA in its determination, and to being part of the discussion as the FAA considers how to expand, train, test, register, track and control commercial UAV use in the United States.

Respectfully Submitted

Rick L. Young
Petitioner

EXAMPLES OF AERIAL SCENE PHOTOGRAPHY





ANOTHER ACTIVE FIRE SCENE: