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

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

July 20, 2015

Exemption No. 12089
Regulatory Docket No. FAA–2015–0556

Ms. Justine M. Kasznica
Schnader Harrison Segal & Lewis LLP
120 Fifth Avenue, Suite 2700
Pittsburgh, PA 15222 −3001

Dear Ms. Kasznica:

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 March 3, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Identified Technologies Corporation (hereinafter petitioner or operator) for an exemption. The exemption would allow the petitioner to operate an unmanned aircraft system (UAS) to conduct aerial surveying and monitoring of project sites.

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

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

Airworthiness Certification

The UAS proposed by the petitioner is a 3D Robotics PixHawk.

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, Identified Technologies Corporation 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, Identified Technologies Corporation is hereafter referred to as the operator.

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

1. Operations authorized by this grant of exemption are limited to the 3D Robotics PixHawk 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 5 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 July 31, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

PETITION FOR EXEMPTION FROM FEDERAL AVIATION REGULATIONS ("FARS") AND REQUEST FOR APPROVAL TO OPERATE UNMANNED AIRCRAFT SYSTEMS UNDER SECTION 333 OF THE FAA REFORM ACT AND PART 11 OF THE FARS

Submitted by: **Identified Technologies Corporation**

Dated: **March 3, 2015**

By Electronic Submission to: www.regulations.gov

By Paper Submission to:

U.S. Department of Transportation
Docket Operations
West building Ground Floor, Room W12-140
1200 New Jersey Avenue, SE
Washington, DC 20590

Filed by:

Justine M. Kasznica
Schnader Harrison Segal & Lewis LLP
Fifth Avenue Place, Suite 2700
Pittsburgh, PA 15222
(412) 577-5114
jkasznica@schnader.com

Barry S. Alexander
Schnader Harrison Segal & Lewis LLP
140 Broadway, 31st Floor
New York, NY 10005
(212) 973-8099
balexander@schnader.com

Counsel for Identified Technologies Corporation

TABLE OF CONTENTS

I. Summary for Publication in Federal Register

Identified Technologies Corporation ("Identified Technologies") has developed a small unmanned aircraft system ("sUAS") designed to support the civil engineering industry by enabling efficient, routine monitoring and producing high resolution and quality precision aerial surveys and imaging of project sites (the "Identified System"). The data obtained through the Identified System helps engineers and surveyors comply with laws and regulations by surveying and monitoring project sites in an efficient and safe manner. It is a low cost solution with low-environmental impact that protects surveyors from the often hazardous conditions present at civil engineering project sites, while optimizing the quality and effectiveness of the data collected.

Identified Technologies hereby petitions the Federal Aviation Administration ("FAA") for an exemption from various Federal Aviation Regulations ("FARs") and requests approval to operate the Identified System in the national airspace (the "Petition") pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the "Act"), 49 U.S.C.S 44701(f), and Title 14 of the Code of Federal Regulations ("CFR"), Part 11 (14 CFR Part 11).

In its Petition, Identified Technologies requests that an exemption be granted from the following regulations:

14 CFR Part 21
14 CFR 43.7
14 CFR 43.11
14 CFR 45.11
14 CFR 45.21
14 CFR 45.23(b)
14 CFR 45.27
14 CFR 45.29
14 CFR 61.113(a) and (b)
14 CFR 67
14 CFR 91.7(a)
14 CFR 91.9(b)(2)
14 CFR 91.9(c)
14 CFR 91.103(b)
14 CFR 91.109
14 CFR 91.119
14 CFR 91.121
14 CFR 91.151(a)
14 CFR 91.203(a) and (b)
14 CFR 91.405(a)
14 CFR 91.407(a)(1)
14 CFR 91.409(a)(2)
14 CFR 91.417(a) and (b)

In its Petition, Identified Technologies also describes in detail (i) the Identified System, (ii) the team that will operate the Identified System and the members' respective roles and

qualifications, (iii) the proposed sUAS operations for which it seeks approval, and (iv) the various safety precautions that will be taken prior to and during the operations. Additional information concerning Identified Technologies System technical specifications is attached hereto as Exhibit A. **Confidential information** concerning Identified Technologies operational procedures, which include the sign-in sheet, preflight procedures, maintenance and operations manual, and operating checklist, is attached to this Petition as Exhibit B (CONFIDENTIAL Supplement), which Identified Technologies requests not to be made public.

In support of its exemption request, Identified Technologies submits that (i) the Identified System is safe, reliable and will satisfy the FAA's airworthiness assessment, (ii) the Pilot in Command (PIC) and visual observer (VO) have the requisite knowledge and experience to ensure the safe operation of the Identified System, (iii) Identified Technologies has developed and complies with operation procedures and parameters that further ensure safe sUAS operations in the national airspace, and which remove the threat of harm to people and property, including other manned aircraft, and (iv) Identified Technologies' proposed operations, which include without limitation, the use of the Identified System to conduct aerial imaging, monitoring and surveying of secure project sites for the benefit of the civil engineering industry, will be safer than that which would be achieved by flying a larger manned aircraft carrying crew and flammable fuel for the same purpose. In addition, permitting use of the Identified System will achieve various economic and environmental benefits, as well as significant efficiencies associated with cost, labor and safety, that serve the public interest.

A. The Identified System

The Identified System is a sUAS that consists of (1) a PixHawk advanced autopilot system designed by the PX4 open-hardware project manufactured by 3D Robotics, (2) a lightweight carbon fiber quadrotor frame based on the Boomerang, and (3) various off-the-shelf rotors and other components that are integrated with the frame and autopilot system. The Identified System is designed to carry an on-board 12MP camera manufactured by GoPro that allows it to conduct precision aerial surveys and collect detailed imagery of project sites. The Identified System is a lightweight, battery-powered quadrotorcraft that, inclusive of the battery and camera, weighs less than 5 pounds and has a width of less than 16 inches and a frame height of less than 6 inches.

B. The Proposed sUAS Operations

Identified Technologies will conduct its sUAS operations in compliance with the FAA Notice 8900.227 Sections 12, 13, 14 and 16, issued on July 30, 2013.

The Identified System will be operated at project sites by a Pilot in Command (PIC), who will be assisted by a ground-based Visual Observer (VO) at all times during the operation. The VO will be standing next to the PIC, will have a clear visual line of sight to the Identified System, and will be able to communicate verbally with the PIC at all times throughout the Identified System's operation. The PIC and VO will have significant experience operating a variety of radio controlled model aircraft and have flown the Identified System in an indoor setting.

Additional Identified System operational restrictions that ensure safe flight include:

1. The Identified System will not be flown at night and will be operated under visual meteorological conditions (VMC) or where visibility is at least 3 statute miles from PIC.
2. Flights will be operated at an altitude of no more than 400 feet AGL, with the majority of flights anticipated to be operated at no more than 270 feet AGL.
3. The Identified System will not be flown at an airspeed exceeding 40 knots.
4. The Identified System will weigh less than 5 lbs.
5. Maximum total flight time for each operational flight will be 12 minutes. Flights will be terminated at 20% battery power reserve should that occur prior to the 12 minute limit.
6. A briefing will be conducted in regard to the planned sUAS operations prior to each day's activities. It will be mandatory that all personnel who will be performing duties in connection with the operations be present for this briefing.
7. The operator will file any necessary paperwork in light of the exemptions with the appropriate Flight Standards District Office ("FSDO").
8. The Identified System will have redundancies and an independent flight termination system (FTS) that can be activated manually by the PIC to ensure the overall safety and predictability of the Identified System.
9. In the event of a loss of communications or signal, the Identified System is programmed to return to its home base.
10. The sUAS will have the capability to abort a flight in case of unexpected obstacles or emergencies.
11. If the multirotor and its controller disconnects during flight, the system's failsafe protection will come to the rescue and the multirotor will return to home and land automatically, rather than flying off uncontrollably or landing at an unknown location.
12. If the multirotor crosses a geo-fence guarding the 500ft perimeter from the public, it will return to home and land automatically.
13. The Identified System will only be flown (i) in rural areas, away from any urban or congested locations, (ii) on secured private property with restricted public access, (iii) in areas located more than 5 miles away from any airport, (iv) in Class G Airspace, and (v) in such locations where the property owner has approved the contemplated sUAS operations.
14. The PIC, VO, and any additional crew members will comply with any additional safety regulations and protocols as may be required by each project site.
15. Identified Technologies will communicate information about specific operations with Air Traffic Control (ATC) nearest to the project site.

16. Identified Technologies will submit a precise description of proposed Identified System operations (Plan of Activities) to the local Flight Services District Office (FSDO) within 3 days prior to the System operations.

17. Identified Technologies will obtain an Air Traffic Organization (ATO) Certificate of Authorization or Waiver (COA) prior to any Identified System operations and will request a Notice to Airmen (NOTAM) at least 48 hours before operating the Identified System.

18. Written and/or oral permission from the relevant property holders will be obtained.

19. All required permissions and permits will be obtained from territorial, state, county or city jurisdictions, including local law enforcement, fire, or other appropriate governmental agencies.

C. Relevant Previously-Granted Exemptions

Identified Technologies bases its Petition, in part, on several relevant Section 333 Petitions that were granted by the FAA in 2014 and early 2015 and makes references to these exemptions throughout. These exemptions include the following:

1. Exemption No. 11109 (the "Clayco Exemption") for sUAS operations used to conduct aerial imaging to monitor and ensure the safety of construction sites.

2. Exemption No. 11114 (the "Woolpert Exemption") for sUAS operations used to conduct precision aerial surveys over Ship Island, Mississippi.

3. Exemption No. 11062 (the "Astraeus Exemption") for sUAS operations used for closed set filming for the motion picture industry.

4. Exemption No. 11136 (the "Advanced Aviation Solutions Exemption") for sUAS operations used to conduct aerial surveys to support the agriculture industry.

5. Exemption No. 11138 (the "Trudeau Exemption") for sUAS operations used to conduct real estate and aerial images of Tucson, AZ to use for marketing purposes.

The FAA granted these exemptions with conditions, having found that the petitioners presented an adequate showing of airworthiness and safety in their described sUAS operation to serve the public interest. Identified Technology's proposed operation does not differ significantly from the situations presented in the Clayco, Woolpert and Advanced Aviation Solutions Exemptions. In fact, the proposed Identified System operations establish at least an equivalent level of safety to the sUAS operations described in the Clayco, Woolpert and Advanced Aviation Solutions Exemptions, and are for purposes that will benefit the public in very similar ways. Given that Identified Technologies plans to operate over similar operating environments, and for similar purposes, and with the airmanship skills necessary to operate the Identified System, the FAA should grant Identified Technologies' Petition.

D. On February 15, 2015, the FAA issued proposed rules for operation and certification of sUAS, which the Identified System would qualify under. (Docket No.: FAA-2015-0150; Notice No. 15-01 concerning 14 CFR Parts 21, 43, 45, 47, 61, 91, 101, 107, and 183). While these rules are open for public comment, have yet to be implemented and therefore do not have the force of law, they are a strong indication of the FAA's inclination to allow sUAS operations such as those proposed by Identified Technologies. Identified Technologies continues to pay close attention to these rules and their development and ultimate implementation.

E. Conclusion

For all the above reasons, Identified Technologies asks that the FAA grant its request for exemption from certain FARs, and approve its operation of the Identified System in the national airspace in accordance with the limitations and restrictions set forth herein.

II. Legal Basis for the Requested Exemption under Section 333

In 2012, Congress passed the FAA Modernization and Reform Act, mandating the FAA to integrate unmanned aircraft systems (UAS) into the national airspace system (NAS). Section 332 of the Act authorizes the FAA to develop regulations for the civil operation of UAS weighing less than 55 pounds. While the final UAS regulations have not yet been issued by the FAA, Congress, in Section 333 of the Act, directed the FAA to allow the operation of civil sUAS even before such final regulations are completed, to the extent that the sUAS operations do not create a hazard to the national airspace system or the public, or pose a threat to national security. 2012 Act, §§ 333(a), (b)(1).

The FAA has authority pursuant to 49 U.S.C.S 44701(f) to grant an exemption from a regulations developed for manned aircraft operations (FARs and other requirements) to the extent the FAA finds that the exemption is "in the public interest." A sUAS operation that is in the public interest has been described as an operation that "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 sUAS to commence immediately." *See* Clayco Exemption, p.8.

Section 333 of the Act mandates the Secretary of Transportation to make a case-by-case determination of safety concerning proposed sUAS operations, by considering 6 factors. The six factors are (1) size, (2) weight, (3) speed, (4) operational capability, (5) proximity to airports and populated areas, and (6) operation within visual line of sight (VLOS). 2012 Act, §§ 333(c). Once safe operation of the sUAS is established, the Secretary must then set forth requirements to facilitate the operation of the sUAS.

III. Identity and Contact Information of the Petitioner

The petitioner is Identified Technologies Corporation, a Pennsylvania corporation with its principal place of business at:

Identified Technologies Corporation
6024 Broad Street, 2R
Pittsburgh, PA 15206
Tel: 908-204-1342
Email: rzhang@identifiedtech.com
Principal Contact: Richard Zhang, CEO

All questions concerning this Petition may be directed to Justine M. Kasznica, counsel for Identified Technologies Corporation, at:

Justine M. Kasznica
Schnader Harrison Segal & Lewis, LLP
Fifth Avenue Place, Suite 2700
120 Fifth Avenue
Pittsburgh, PA 15222
(412) 577-5114
jkasznica@schnader.com

Barry S. Alexander
Schnader Harrison Segal & Lewis LLP
140 Broadway, 31st Floor
New York, NY 10005
(212) 973-8099
balexander@schnader.com

IV. The Identified System

The sUAS for which Identified Technologies seeks approval is a small, unmanned quadrotor aircraft based on the Boomerang, weighing less than fifteen (5) pounds (inclusive of batteries and technical payload). This rotorcraft will operate at a speed of ten (10) knots, and in no event can will it exceed forty (40) knots. The rotorcraft has the capability to hover and move in the vertical and horizontal planes simultaneously.

The technical specifications of the Identified System are as follows:

1. Airframe: Boomerang Carbon Fiber Frame
2. Control System: 3DR PixHawk (3D Robotics)
3. Tx[1]: Turnigy TGY 9X
4. Rx[2]: Turnigy 9X
5. Motors: T-Motor MN3508

---

1 "Tx" represents radio transmitter for command and control.

2 "Rx" represents radio receiver for command and control.

6. Propellers: Tiger RC 15” Carbon Fiber
7. Data Link: 3DR 915 MHz Radio, and 2.4 GHz 802.11
8. Camera: GoPro Hero 3+
9. Batteries: Turnigy 5000 mAh Li-Po
10. Empty Weight: <5lbs
11. Minimum Takeoff Weight: <5lbs
12. Maximum Takeoff Weight: <5lbs
13. Flight Time: 12 minutes
14. Programmed Range: >1mile
15. Maximum Wind Speed for Flight: 25 knots
16. Maximum Speed: 40 knots
17. Programmed Speed: 10 knots

The Identified System is manually controllable at all times, and while it has preprogrammed autopilot capability, it is not completely autonomous and the PIC can override it at any time using manual controls. A PIC controls vertical and lateral movement by varying rotor RPM among the four rotors, independently for lateral movement and collectively for vertical movement.

The Identified System contains a PixHawk advanced autopilot system manufactured by 3D Robotics known for its reliability and safety features. The PixHawk allows for scripting of missions and flight behaviors, and contains precise altitude and speed controls, and an on-board airspeed sensor. Additional safety features of the PixHawk include (1) an external safety switch for motor deactivation, (2) an integrated backup system for in-flight recovery and manual override with dedicated processor and stand-alone power supply, (3) a backup system providing consistent autopilot and manual override modes, (4) redundant power supply inputs and automatic failover, (5) a multicolor LED visual indicator and high-power audio indicator, and (6) a microSD card for high-rate, continuous logging.

The Identified System tracks its battery life in real-time and is programmed to return to its launch location automatically in the event its battery life reaches 20%. The frame and propellers of the Identified System are made of high-quality, light-weight carbon fiber. The Identified System uses a 3DR 915 MHz Radio, and 2.4 GHz 802.11 communications link, which does not require any additional Federal Communications Commission (FCC) approvals beyond what is already approved for use commercially.

Finally, an off-shelf GoPro Hero 3+ camera is mounted to the Identified System airframe. The camera features include high-definition video recording with resolutions of 1080p60, 960p60 and 720p120 fps, a wide-angle glass lens and 10.0MP still image resolution, allowing it to take highly precise video and photographs.

Further technical information about the GoPro Hero 3+, Tiger propellers, Boomerang Frame, and the PixHawk control system can be found in the “Identified System: Technical Specifications”, attached hereto as Exhibit A.

V. The Proposed sUAS Operation

The Identified System will be used to (i) conduct routine monitoring and (ii) produce high resolution and quality precision aerial surveys and imaging of project sites for the civil engineering industry. It is a low cost solution with low-environmental impact that protects surveyors from the often hazardous conditions present at civil engineering project sites, while optimizing the quality and effectiveness of the data collected.

A. Selection of Appropriate Project Sites

Identified Technologies wishes to operate the Identified System for the purpose of conducting aerial surveys and imaging of project sites for the civil engineering industry. Typical project sites may include: (1) commercial and residential construction sites, (2) oil and gas and alternative energy sites, (3) public utility sites, (4) mining sites, (5) quarries, (6) excavation sites, and (7) and other infrastructure development sites. Identified Technologies will select appropriate projects sites based on safety considerations and any restrictions imposed by the FAA that are related to sUAS operations ("Appropriate Project Sites" or "APS"). As such, Appropriate Project Sites are limited to those project sites that have the following operating environment:

1. ASPs will be located in rural areas, away from any urban or congested locations.
2. ASPs will be located on secured private property with restricted public access.
3. ASPs will be located more than 5 miles away from any airport.
4. ASPs will be located in Class G Airspace.
5. ASPs will be such locations where the property owner has approved the contemplated sUAS operations.

Identified Technologies will not operate the Identified System at project sites that are not determined to be Appropriate Project Sites.

Pending the grant of this Petition by the FAA, Identified Technologies, together with its prospective customer, Pittsburgh-based Civil & Environmental Consultants, Inc., have identified three Appropriate Project Sites for the purpose of testing the Identified System, training its PICs and VOs to operate the Identified System, and conducting Identified Technologies' first commercial sUAS operations.

These Appropriate Project Sites include:

1. *ASP No.1*

   Identified Technologies seeks to operate the Identified System at a private gas plant in West Virginia. The surrounding area's primary land use is timber farming, pasture land and farming. The plant is located in a rural area in class G airspace and more than 20 miles from the closest airport. The property will be fenced off and secured, which will restrict public access.

2. *ASP No. 2*

   Identified Technologies seeks to operate the Identified System at a private gas plant in West Virginia. The nearest population center is located approximately 10

miles from the plant. The plant is located in a rural area in class G airspace and more than 5 miles from the closest airport, Glendale Airport. The property will be fenced off and secured, which will restrict public access.

3. *ASP No. 3*

Identified Technologies seeks to operate the Identified System at a private gas plant in Pennsylvania. The surrounding area's primary land use is timber farming, pasture land and farming. The plant is located in a rural and unpopulated location in class G airspace and more than 40 miles from the closest airport. The property will be fenced off and secured, which will restrict public access.

If its Section 333 exemption request is granted, Identified Technologies intends to expand its sUAS operations to other similar Appropriate Project Sites within the United States.

B. The Identified System Operator Qualifications

The Identified System will be operated at Appropriate Project Sites by a Pilot in Command (PIC), who will be assisted by a ground-based Visual Observer (VO) at all times during the operation. The VO will be standing next to the PIC, will have a clear visual line of sight to the Identified System, and will be able to communicate verbally with the PIC at all times throughout the Identified System's operation. The two PICs currently contemplated by Identified Technologies' are engineers with significant experience operating the Identified System in an indoor setting. Moreover, collectively, they have on order of 1,000 hours of radio controlled (RC) flying experience, operating RC aircraft and multicopters for hobby and recreational purposes.

As of now, the Identified Technology PICs do not have a private pilot license or third class medical certificate, and Identified Technologies petitions the FAA for an exemption from the requirements of Section 61.113 (a) and (b) of Title 14, Code of the Federal Regulations (14 C.F.R.) for the reasons set forth in Section 8.I, below.

If required by the FAA, however, the PIC will obtain a private pilot certificate and third class medical certificate.

C. Training

If this Petition is granted by the FAA, the PIC and VO intend to test fly the Identified System outdoors, at the Appropriate Project Sites described above, or in locations bearing the same characteristics. Identified Technologies will adopt the FAA's findings regarding sufficient training protocol for its PICs, whatever they may be, prior to conducting any commercial operations of the Identified System, and proposes the following in this regard (taken from the training requirements outlined by the FAA in the Trudeau Exemption, at pages 14-15, basing its analysis on the Astraeus Exemption):

> The PIC must have accumulated and logged at least 25 hours of total time as a UAS rotorcraft pilot including at least 10 hours logged as a UAS pilot with a multi-rotor UAS. The PIC must also have accumulated and logged a minimum of 5 hours as a UAS pilot operating the same make and model of UAS to be used for operations under the exemption.

For clarification, these minimum hour requirements will be inclusive rather than additive; that is, 5 hours using the same system contemplated for operations may be included in the 10 hours of multirotor time and the 10 hours may be included in the total 25 hours of UAS rotorcraft time. In addition to the hour requirements, the PIC must accomplish 3 take-offs and landings in the preceding 90 days (for currency purposes). .

This will ensure the PICs to get sufficient flight experience to begin using the Identified System outdoors for the specified purposes outlined in this Petition.

D. Identified System Flight Operations

The purpose of every Identified System flight will be to safely, accurately, and efficiently create survey maps and imaging of a project site. The Identified System will collect photogrammetric pictures, survey equipment to set ground control points, and use specialized photogrammetry software to process the data. The survey output will be 3D surface models and high resolution aerial photographs.

Every sUAS flight will use at minimum a two man flight crew, including the PIC and VO.

The standard pre-flight and operational procedure is as follows:

1. Meet at the security gate and complete pre-flight security, as appropriate for each site.
2. Set up a "no-entry" perimeter around the jobsite forbidding entrance by non-authorized personnel.
3. Drive around the project site to ensure it is clear of non-authorized personnel.
4. Drive to the area to be surveyed.
5. Ensure that all necessary equipment, including the Flight Log, operating manuals and checklists, are readily accessible.
6. The Pilot in Command begins to ready sUAS for flight.
    a. Set up the hand held weather station on tripod.
    b. Check over the airframe, connections, and propellers for any damage during transport in vehicle.
    c. Calibrate the camera.
    d. Turn on and ready the Ground Control Station (GCS).
    e. Connect communication antennae to the GCS.
    f. Open Ground Station software and pull up the pre-planned photogrammetry flight path.
    g. Remove the main flight Tx from its case, power it up, and verify voltage and settings.
    h. Remove the battery for flight, measure current voltage, and log findings in the battery manual.

i. Strap the batteries securely onto Identified System; do not attach the main power.

j. Move the Identified System to take off point, approximately 30 feet from crew.

k. Attach the main power.

l. Listen to the power up sequence of beeps from the ESC and motors.

m. Using the Flight Tx, cycle through different control modes, and observe on-board LED lights for good connection and response.

n. Set up traffic cones around the sUAS with a 20-foot (approximate) radius. This is the "home" area; operators are not allowed inside this area while the electrical motor is running.

o. Walk back to the vehicle with the Tx.

p. Using the Flight Tx, activate engine power without moving the throttle up. This checks that the automatic throttle kill is working and also records the "home" point.

q. Using the laptop Ground Station, select the button connecting the laptop to the sUAS.

r. The sUAS should appear on the screen, along with a recorded home point, battery voltage, current altitude relative to the ground, and current velocity.

s. Upload the flight path data to the sUAS.

t. Set a geo-fence around the jobsite so that when crossed the sUAS returns to Home. The Geo-fence will ensure that the sUAS never comes within the 500 ft limit from the public.

u. Verify good upload and connection.

v. Verify weather from the portable weather station.

w. Record the time and weather in Flight Log.

x. The sUAS is now fully prepared and ready to go.

7. While the PIC is readying the aircraft, the VO, or secondary crew member, is preparing the Ground Control Points (GPC's) and walking the site.

a. Power up and calibrate the survey grade GPS equipment.

b. Begin setting the GCPs and shooting the center of targets with survey GPS.

c. While setting out the GCP's, the secondary crew member is also making sure area is clear of all people.

8. Typically, the secondary crew member and the PIC finish at about the same time. Upon his return, the secondary crew member sets the survey GPS to the side and sits next to the laptop and camera Tx.

9. The PIC double checks that the take-off area is clear.

10. The PIC takes off flying to the approximate survey altitude.

11. The PIC instructs secondary crew member to initiate the preprogrammed flight path.

12. The secondary crew verifies that the Ground Station has a good connection and is tracking the sUAS.

13. The secondary crew then turns on the camera to take pictures at a continuous interval.

14. During the entire preprogrammed flight, the PIC and VO always have visual line of sight (VLOS) and the PIC is prepared to take over flight operations as needed to ensure safe operations.

15. The PIC's Tx has a flight count-down timer which is set to a minimum of 20% battery reserve (Calculated based on prior field experience to safely return the sUAS to safe landing with ample margin of error). The timer begins from the point the throttle is moved out of its start position.

16. During flight, a secondary crew member vigilantly monitors the Ground Station data (voltage, forward velocity, altitude, and estimated remaining time to complete the mission) and relays any sudden changes or alerts to the PIC.

17. As the mission completes, the PIC informs the secondary crew he is taking back over control.

18. The secondary crew turns off the camera.

19. The PIC begins to land the sUAS.

20. After safely landing, the PIC immediately goes and unplugs the main power. He then checks the pictures to verify if the pictures are good and the mission was successful.

21. If successful, the secondary crew leaves to go pick up GCPs.

22. The PIC checks battery voltage and records in battery log.

23. The PIC records flight time in Flight Log.

24. The PIC turns off both Tx, secondary GPS, and camera.

25. The PIC looks over airframe to see if any damage or loose connections resulted from the flight, and records any findings.

26. The PIC begins to pack all equipment up for safe transport.

VI. The Identified System and Equivalent Level of Safety

Identified Technologies proposes that the exemption requested herein apply to civil aircraft that have the characteristics and that operate within the limitations listed herein. These

limitations provide for at least an equivalent or higher level of safety to operations under the current regulatory structure.

The limitations and conditions to which Identified Technologies agrees to be bound when conducting commercial operations under an FAA issued exemption include:

1. The Identified System will not be flown at night and will be operated under visual meteorological conditions (VMC) or where visibility is at least 3 statute miles from PIC.
2. Flights will be operated at an altitude of no more than 400 feet AGL, with the majority of flights anticipated to be operated at no more than 270 feet AGL.
3. The Identified System will not be flown at an airspeed exceeding 40 knots.
4. The Identified System will weigh less than 5 lbs.
5. Maximum total flight time for each operational flight will be 12 minutes. Flights will be terminated at 20% battery power reserve should that occur prior to the 12 minute limit.
6. A briefing will be conducted in regard to the planned sUAS operations prior to each day's activities. It will be mandatory that all personnel who will be performing duties in connection with the operations be present for this briefing.
7. The operator will file any necessary paperwork in light of the exemptions with the appropriate Flight Standards District Office ("FSDO").
8. The Identified System will have redundancies and an independent flight termination system (FTS) that can be activated manually by the PIC to ensure the overall safety and predictability of the Identified System.
9. In the event of a loss of communications or signal, the Identified System is programmed to return to its home base.
10. The sUAS will have the capability to abort a flight in case of unexpected obstacles or emergencies.
11. If the multirotor and its controller disconnects during flight, the system's failsafe protection will come to the rescue and the multirotor will return to home and land automatically, rather than flying off uncontrollably or landing at an unknown location.
12. If the multirotor crosses a geo-fence guarding the 500ft perimeter from the public, it will return to home and land automatically.
13. The Identified System will only be flown (i) in rural areas, away from any urban or congested locations, (ii) on secured private property with restricted public access, (iii) in areas located more than 5 miles away from any airport, (iv) in Class G Airspace, and (v) in such locations where the property owner has approved the contemplated sUAS operations.
14. The PIC, VO, and any additional crew members will comply with any additional safety regulations and protocols as may be required by each project site.

15. Identified Technologies will communicate information about specific operations with Air Traffic Control (ATC) nearest to the project site.

16. Identified Technologies will submit a precise description of proposed Identified System operations (Plan of Activities) to the local Flight Services District Office (FSDO) within 3 days prior to the System operations.

17. Identified Technologies will obtain an Air Traffic Organization (ATO) Certificate of Authorization or Waiver (COA) prior to any Identified System operations and will request a Notice to Airmen (NOTAM) at least 48 hours before operating the Identified System.

18. Written and/or oral permission from the relevant property holders will be obtained.

19. All required permissions and permits will be obtained from territorial, state, county or city jurisdictions, including local law enforcement, fire, or other appropriate governmental agencies.

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 exemption allowing commercial operation of the Identified System to support the civil engineering industry pursuant to Identified Technology's rules of operation described herein.

Additional information concerning Identified operational procedures, which include the sign-in sheet, preflight procedures, maintenance and operations manual, and operating checklist, are attached to this Petition as Exhibit B (CONFIDENTIAL Supplement), which Identified Technologies requests not to be made public.

VII. Privacy

There is little risk that the proposed use of the Identified System will result in any privacy violations because all flights will occur over private or controlled access property with the property owner's prior consent and knowledge. In addition, the anticipated project site locations will be in rural or unpopulated areas, and there is little chance that there will be inhabited houses in the visual area or other people who have not consented to being filmed or otherwise agreed to be in the area where filming will take place. No attempt will be made to identify any individuals filmed during the flights except in cases where they are trespassing upon or damaging customer property, or interfering with the applicant's or its customers' operations.

VIII. Public Interest and Safety

The civil engineering industry routinely utilizes workers on the ground to monitor, take photos, and conduct surveys of project sites. Project sites in the oil and gas, mining, excavation, and construction industries are known to be unsafe. Hazards at these sites include (1) exposure to dangerous chemicals, (2) unsafe ground conditions due to uneven terrain, debris, construction materials, and heavy equipment that lead to on-site injuries, (3) extreme temperatures which can lead to related illness and injury.

Use of the Identified System will increase ground safety by eliminating ground surveying and the hazards associated therewith. By flying the Identified System over the project sites, rather than putting workers on the ground, the hazards stemming from these conditions will be removed.

The use of the Identified System for these purposes will achieve significant economic efficiencies as well. The Identified System can complete each surveying task in under fifteen minutes, a drastic reduction in the amount of time as compared to surveyors who conduct ground surveys, who may otherwise spend three or more hours at a time in these conditions.

Finally, inspections and monitoring of project sites by the Identified System will help project site owners identify dangerous conditions, including possible fires which have the potential to spread as wildfires, and may prevent serious injury to employees and other on-site and near-site personnel.

For all these reasons, the sUAS operations contemplated by Identified Technologies achieve a level of safety equal to or greater than that which would be achieved by flying a much larger manned aircraft carrying crew and flammable fuel for the same purposes.

IX. Exemptions Requested under Section 333

Identified Technologies requests that an exemption be granted from the following regulations:

A. 14 CFR Part 21
B. 14 CFR 43.7
C. 14 CFR 43.11
D. 14 CFR 45.11
E. 14 CFR 45.21
F. 14 CFR 45.23(b)
G. 14 CFR 45.27
H. 14 CFR 45.29
I. 14 CFR 61.113(a) and (b)
J. 14 CFR 67
K. 14 CFR 91.7(a)
L. 14 CFR 91.9(b)(2)
M. 14 CFR 91.9(c)
N. 14 CFR 91.103(b)
O. 14 CFR 91.109
P. 14 CFR 91.119
Q. 14 CFR 91.121
R. 14 CFR 91.151(a)
S. 14 CFR 91.203(a) and (b)
T. 14 CFR 91.405(a)
14 CFR 91.407(a)(1)
14 CFR 91.409(a)(2)
14 CFR 91.417(a) and (b)

The regulations and the basis for an exemption are set forth as follows.

A. 14 CFR Part 21 Certification Procedures for Products and Parts—prescribes the procedural requirements for issuing and changing design approvals, production approvals, airworthiness certificates, and airworthiness approvals.

Identified Technologies requests an exemption from 14 CFR Part 21 to the extent applicable. This exemption meets the requirements for an equivalent level of safety pursuant to Section 333 based on the small size, light weight, relatively slow speed, safety and fail-safe system specifications of the Identified System, and its use in controlled rural environments on private land with restricted public access, as described previously in this Petition. Moreover, the Identified System carries no fuel and is therefore not at risk of fuel spillage and fire in the event of an accident.

If the exemption is granted, and an airworthiness certificate is not required, noise certification and testing also will not be required. See FAA, *Public Guidance for Petitions for Exemption Filed Under Section 333* (September 25, 2014), at 4. In any event, the Identified System is a small, battery powered system designed to emit very little noise.

Notwithstanding the foregoing, the FAA has previously determined that relief under Part 21 is not necessary for petitioners who have presented facts substantially similar to those presented by Identified Technologies. (See Exemption Nos. 11109, 11114, 11062, 11136, 11138, referenced in Section I, above).

B. 14 CFR 43.7 Persons authorized to approve aircraft, airframes, aircraft engines, propellers, appliances, or component parts for return to service after maintenance, preventive maintenance, rebuilding, or alteration—provides that the holder of a mechanic certificate or a repair station certificate may approve an aircraft, airframe, aircraft engine, propeller, appliance, or component part for return to service.

Identified Technologies requests an exemption from 14 CFR 43.7. The Identified System is comprised of parts and components that are no different from a model aircraft, and the contemplated operators of the Identified System, who will maintain and when necessary repair the System, have engineering degrees. The operators will conduct inspections and maintenance based on maintenance guidelines, attached for reference as Exhibit B. The capabilities of these operators to maintain and repair the Identified System will meet the requirements for an equivalent level of safety pursuant to Section 333 for the type of sUAS, its intended use, and the intended operating environment and locations.

C. 14 CFR 43.11 Content, form, and disposition of records for inspections conducted under parts 91 and 125—provides, in pertinent part, that maintenance record entries be maintained and a record for the listing of discrepancies and placards by inspectors be maintained.

Identified Technologies requests an exemption from 14 CFR 43.11. The Identified System's central frame is less than 6 inches high. There is no room on the sUAS to store or display placards or records. Additionally, no inspections for the Identified System have been

conducted or certified by FAA at the present time. However, as a condition to the approval of exemption, Identified Technologies is willing to keep log books of all maintenance and repairs, and such log books will be available at each project site during the sUAS operations.

D. 14 CFR 45.11 Marking of Products—prescribes, in pertinent part, that the manufacturers of aircraft, engines and propellers mark such aircraft, engines, or propellers with an approved fireproof identification plate.

Identified Technologies requests an exemption from 14 CFR 45.11. The Identified System, due to its small size, does not have room for fireproof identification plates to be placed in it. Any required fireproof identification plates could become hazardous due to the additional weight and strain placed on the System.

E. 14 CFR 45.21 General—prescribes, in pertinent part, that no person may operate a U.S.-registered aircraft unless that aircraft displays nationality and registration marks in accordance with the requirements of this section and §§45.23 through 45.33.

Identified Technologies requests an exemption from 14 CFR 45.21. To date, no requirements or procedures for obtaining a registration mark for a sUAS have been established by the FAA. However, as a condition to the approval of exemption, Identified Technologies is willing to be assigned a registration number and to display it to the extent practicable.]

F. 14 CFR 45.23(b) Display of Marks; general—prescribes, in pertinent part, that when marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted, or 2 light-sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "light-sport," "experimental," or "provisional," as applicable.

Identified Technologies requests an exemption from 14 CFR 45.23(b), to the extent applicable. The Identified System's center airframe is less than 6" in height. Due to its small size, the Identified System does not have room to display aircraft marks in a conventional size. However, as a condition to the approval of exemption, Identified Technologies is willing to affix an aircraft mark to one or more of the "arms" of the Identified System mainframe. The size of the marking will be determined by the size of the "arm" being used and may be less than 1 inch in size.

The word "Experimental" will be placed on the center frame of the Identified System in compliance with §45.29(f). However, a partial exemption from this display regulation is requested as the sUAS will have no entrance to the cabin, cockpit or pilot station on which the word "Experimental" can be placed. Given the size of the sUAS, two-inch lettering will be impossible.

The equivalent level of safety will be provided by having the Identified Technologies sUAS marked on its center frame as required by §45.29 (f), where the PIC, observer and others working with the sUAS will see the identification of the sUAS as "Experimental." The requested exemption is consistent with previous exemptions issued by the FAA—the FAA has previously determined that relief under 14 CFR 45.23(b) is not necessary for petitioners who have present facts substantially similar to those presented by Identified Technologies. (See Exemption Nos. 11109, 11114, 11062, 11136, 11138, referenced in Section I, above).

G. 14 C.F.R. 45.27 Location of Marks; nonfixed-wing aircraft—prescribes, in pertinent part, that each operator of a rotorcraft must display on that rotorcraft horizontally on both surfaces of the cabin, fuselage, boom, or tail the marks required by §45.23.

Identified Technologies requests an exemption from 14 C.F.R. 45.27. The Identified Systems does not have a cabin, fuselage, boom or tail to display the marks as required by §45.23. Identified Technologies will place marks, to the extent practicable, on one of the "arms" of the main frame of the sUAS.

H. 14 C.F.R. 45.29: Size of Marks—prescribes, in pertinent part, that the registration marks for rotorcraft must be at least 12 inches high.

Identified Technologies requests an exemption from 14 CFR 45.29. The Identified System, due to its small size, does not have any surface area large enough to display marks that are 12 inches high. As a condition to the approval of exemption, however, Identified Technologies is willing to affix an aircraft mark to one or more of the "arms" of the main frame of the sUAS. The size of the marking will be determined by the size of the "arm" being used and may be less than 1 inch in size.

I. 14 CFR 61.113(a) and (b) Private pilot privileges and limitations: Pilot in command—prescribe that (a) No person who holds a private pilot certificate may act as a pilot in command (PIC) of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as the PIC of an aircraft; (b) A private pilot may, for compensation or hire, act as PIC of an aircraft in connection with any business or employment if (1) the flight is only incidental to that business or employment; and (2) the aircraft does not carry passengers or property for compensation or hire.

Identified Technologies requests an exemption from 14 C.F.R. 61.113. It is contemplated that the PIC (pilot in command) of the sUAS will not possess a private or commercial license. However, because (i) the sUAS is no different a model aircraft, weighs less than 15 lbs. including payload, and will not carry any pilot or passengers, (ii) the area of operation is controlled and restricted, (iii) all flights will be planned and coordinated in advance, and (iv) the maximum altitude of the sUAS will not exceed 400 feet AGL, the proposed operations will achieve the equivalent level of safety of current operations by manned aircraft with airmen holding a private or commercial pilots license.

For conducting safe sUAS operations, it is more important that the PIC of the sUAS be experienced, particularly with the sUAS at issue, than for the PIC to have a pilot's license. The PICs operating under this exemption will be experienced. The two PICs currently contemplated by Identified Technologies have engineering degrees and a deep knowledge of sUAS systems, 1.5 years of radio control aircraft experience and has recreationally flown the Identified System in excess of 150 flights, and, therefore, meets or exceeds the present level of safety envisioned under this Section.

Model aircraft, RC planes, and even certain unmanned military systems are routinely flown, successfully and safely, by hobbyists or personnel who do not have a private or commercial license. Research into this area has shown that the skill set needed to successfully and safely operate the UAS is very different from the set of skills needed by a pilot of manned aircraft. In fact, research has shown that a manned aircraft pilot is not equipped, merely by virtue of his obtaining pilot certification, to fly or operate a remote-controlled unmanned aircraft safely. In fact, in some cases a manned aircraft pilot's training may be counterproductive when operating unmanned aircraft.[3]

Identified Technologies recognizes that the FAA, in addressing other Section 333 exemption requests, has made it clear that it does not have the requisite authority to exempt a petitioner from the statutory requirement to hold an airman certificate under 49 USC § 44711, and has found that a pilot certificate would ensure that a PIC passes the security screening of the Department of Homeland Security.

If the FAA is unwilling to grant this exemption on the same grounds, Identified Technologies asks that the FAA grant it the same relief that it has granted to other petitioners who presented substantially similar facts to that of Identified Technologies. *See* Exemption Nos. 11109, 11114, 11062, 11136, 11138, referenced in Section I, above. For example, in the Trudeau Exemption, the FAA required the PIC to obtain at minimum, a private pilot license and outlined a training program to substantiate the PICs experience. Identified Technologies has already adopted the same training program and if necessary, will require that its PIC obtains a private pilot license.

> **J. 14 CFR Part 67 Medical Standards and Certification**—gives the FAA the authority to issue the necessary medical standards and certifications for pilots. FAA Notice 8900.227, paragraph 16.c.(4) PIC Medical, states, in pertinent part, that the PIC must maintain, at a minimum, a valid FAA second-class medical certificate issued under 14 CFR Part 67, Medical Standards and Certification, or the FAA-recognized equivalent. Paragraph 16.e.(1) of the same Notice requires, in pertinent part, that all observers must have a valid FAA second-class medical certificate issued under part 67; an FAA-recognized equivalent is an acceptable means of demonstrating compliance with this requirement. The FAA notes that the notice referenced above is now incorporated into FAA Order 8900.1, vol. 16, ch. 4., sec. 1.

[3] Examples of this research can be found in (1) Michael J. Barnes, Beverly G. Knapp, Barry W. Tillman, Brett A. Walters & Darlene Veliki, *Crew Systems Analysis of Unmanned Aerial Vehicle (UAV) Future Job and Tasking Environments*, Technical Report ARL- TR-2081, Aberdeen Proving Ground, MD: Army Research Laboratory, page 12 (2000); (2) Kevin W. Williams, *Unmanned Aircraft Pilot Medical Certification Requirements,* Report DOT/FAA/AM-07/3, FAA Civil Aerospace Medical Institute, page 2, (2007), available at http://fas.org/irp/program/collect/ua-pilot.pdf; and (3) Jason S. McCarley & Christopher D. Wickens, *Human Factors Implications of UAVs in the National Airspace, Institute of Aviation,* Aviation Human Factors Division, University of Illinois at Urbana-Champaign, 13 (2004), available at http://www.tc.faa.gov/logistics/grants/pdf/2004/04-G-032.pdf, citing Barnes, supra.

Identified Technologies requests an exemption from FAA Notice 8900.227, paragraph 16.c.(4) and 16.e.(1) which requires that a PIC require a valid FAA second-class medical certificate under 14 CFR 67. Identified Technologies' currently contemplated PICs do not currently hold a valid FAA medical certificate. Identified Technologies respectfully submits that a second-class medical certificate is unwarranted in this instance because (i) the sUAS is no different a model aircraft, weighs less than 5 lbs. including payload, and will not carry any pilot or passengers, (ii) the area of operation is controlled and restricted, and (iii) all flights will be planned and coordinated in advance with an auto-pilot feature and fail-safe programs to account for user error. There is little chance that the medical condition of the PIC will affect the Identified System operations in any unsafe or damaging way.

To the extent the FAA requires the PIC to obtain a valid FAA medical certificate as a condition of permitting Identified System operations, however, Identified Technologies asks that the FAA grant it the same relief that it has granted to other petitioners who presented substantially similar facts to that of Identified Technologies. *See* Exemption Nos. 11109, 11114, 11062, 11136, 11138, referenced in Section I herein. For example, in the Trudeau Exemption, the FAA found that a PIC holding a private pilot certificate and a third-class airman medical certificate is appropriate for the proposed operations. If the grant of this Petition is conditioned upon the PIC obtaining a valid FAA medical certificate, Identified Technologies will of course comply with that condition.

K. 14 CFR 91.7(a) Civil aircraft airworthiness—prescribes that no person may operate a civil aircraft unless it is in an airworthy condition.

Identified Technologies requests an exemption from 14 CFR 91.7(a). Currently there is no standard for determining the airworthiness of an sUAS, and no airworthiness certificate can be issued for the Identified System should this exemption be granted.

An equivalent level of safety is met, given the size, weight, and performance specifications of the Identified System, as well as the requirements contained in the flight operations described above, including the maintenance procedures and use of safety check lists prior to each flight that have been submitted as Exhibit B.

L. 14 CFR. 91.9(b)(2) Civil aircraft flight manual, marking, and placard requirements—prescribes, in pertinent part, that no person may operate U.S.-registered civil aircraft 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. Approvals are granted under 14 CFR 91.203 (a) and (b).

Identified Technologies requests an exemption from 14 CFR 91.9(b)(2). First, there is currently no approval process for Airplane or Rotorcraft Flight Manuals. Second, the FAA has previously determined that relief from this section is not required, provided that relevant materials are kept in a location accessible to the PIC in compliance with the regulations. *See* the Trudeau Exemption at pg. 17. Identified Technologies has developed a flight operations manual and relevant materials for use during the Identified System operations, which it requires to be readily accessible to the PIC and VO during all Identified System operations.

M. 14 C.F.R. 91.9(c) Civil aircraft flight manual, marking, and placard requirements—prescribes that "(c) No person may operate a U.S.-registered civil aircraft unless that aircraft is identified in accordance with part 45 of this chapter."

Identified Technologies requests an exemption from 14 CFR 91.9(c). As previously stated, there is no current registration process for sUAS; and the Identified System, due to its small size, does not have room to contain fireproof placard or to display aircraft marks in a conventional size. However, as a condition to the approval of petition, Identified Technologies is willing to affix an aircraft mark to one or more of the "arms" of the Identified Technologies sUAS. The size of the marking will be determined by the size of the "arm" being used and may be less than 1 inch in size.

***N.* 14 CFR 91.103(b)(2) Preflight action**—prescribes that each PIC shall, before beginning a flight, become familiar with all available information concerning that flight. This information must include… (b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information: (1) For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein; and (2) For civil aircraft other than those specified in paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.

Identified Technologies requests an exemption from 14 CFR 91.103(b)(2). Currently, there is currently no approval process for Airplane or Rotorcraft Flight Manuals. However, the Identified Technologies PIC will, prior to conducting any sUAS operations, become familiar with all available information concerning that flight. Such actions, described at length in this Petition, will include reviewing weather conditions and visibility, flight battery life, landing and takeoff distances, and all other aircraft performance data prior to any Identified System operations. The flights of the Identified System will only be conducted at Appropriate Project Sites, with the PIC and VO having extensive knowledge of the operating environment. .

O. 14 CFR 91.109 Flight instruction; Simulated instrument flight and certain flight tests—prescribes, in pertinent part, 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.

Identified Technologies requests an exemption from 14 CFR 91.109. Remotely piloted aircraft, including the Identified System, are designed and constructed without dual controls. Flight control will be accomplished through the use of a control box that communicates with the aircraft via radio communications. The equivalent level of safety is provided by the limited size and speed of the aircraft and by the fact that neither a pilot nor passengers will be carried in the aircraft. Moreover, the Identified System has a control system with a mix mode feature that allows for intermittent manual override of the autopilot control to achieve maximum safety and controlled operation of the Identified System.

P. 14 CFR 91.119 Minimum safe altitudes: General—prescribes that, except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes: (a) Anywhere. An altitude allowing, if a power unit fails, an

emergency landing without undue hazard to persons or property on the surface. (b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open-air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft. (c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure. (d) Helicopters, powered parachutes, and weight-shift-control aircraft. If the operation is conducted without hazard to persons or property on the surface … (1) A helicopter may be operated at less than the minimums prescribed in paragraph (b) or paragraph (c) of this section, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA; and (2) A powered parachute or weight-shift-control aircraft may be operated at less than the minimums prescribed in paragraph (c) of this section.

Identified Technologies requests an exemption from 14 CFR 91.119. Identified Technologies will not operate the Identified System at an altitude higher than 400 feet AGL. Furthermore, while Identified Technologies will not be operating over any congested areas, the sUAS will necessarily be flown closer to 500 feet to the structures it will be examining.

The requirements set out in this petition for the sUAS operations contemplated by Identified Technologies provide for an equal or greater level of safety that would be provided by the operation of manned aircraft maintaining a distance of at least "500 feet to any person, vessel, vehicle, or structure," in light of the small size and relatively light weight of the sUAS, the close monitoring of the flight by both the pilot in command and the secondary ground crew member, the remote and secured nature of the operating environment, and the other detailed operating limitations described in this Petition.

Q. 14 CFR 91.121 Altimeter settings—prescribes, in pertinent part, 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."

Identified Technologies requests an exemption from 14 CFR 91.121. Identified Technologies will not operate the Identified System above 400 feet AGL, nor will it operate the Identified System at a sustained cruising altitude like a manned aircraft. The laptop used in the ground station has live feedback information about the Identified System operation, including but not limited to, the altitude of the sUAS, its forward velocity, and the compass heading. The PIC will be able to observe and control the maximum altitude of the Identified System at all times. Additionally, the sUAS will be operated within the line of sight. For all these reasons, an equivalent level of safety to that contemplated by Section 91.121 will be provided.

R. 14 CFR 91.151(a) Fuel requirements for flight in VFR conditions—prescribes that no person may begin a flight in an airplane under visual flight rules (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; or (2) At night, to fly after that for at least 45 minutes.

Identified Technologies requests an exemption from 14 CFR Part 91.151(a). The Identified System will be operated in a manner that is at least as safe as the operation of a manned aircraft complying with Part 91.151(a) because the Identified System will only be flown in daylight, and the short distances over which the sUAS will be operated (substantially less than one mile) will allow the sUAS to be flown to a safe landing point within the area of operation within a short period of time.

During the entire pre-programmed flight, the PIC will always have a visual line of sight and be prepared to take over. The PIC's Tx has a flight count down timer which is set to a minimum of 20% battery reserve (defined as allowing an additional 3 minutes of flight time); more than enough to safely fly the sUAS back to the roped off "home" area.

Given the limited size and speed of the sUAS, its ability to land safely almost anywhere, the fact that it will be under the PICand VO's visual observation at all times, and will be operated in a tightly controlled area, where all people other than the PIC and VO will be removed before flight, permitting its operation with less than 30 minutes of reserve fuel does not engender the type of risks that Section 91.151(a) was intended to alleviate.

S. 14 CFR 91.203(a) and (b) Civil aircraft: Certifications required—. Section 91.203(a) prescribes, in pertinent part, that no person may operate a civil aircraft unless it has within it—(1) An appropriate and current airworthiness certificate; and (2) An effective U.S. registration certificate issued to its owner or, for operation within the United States, the second copy of the Aircraft Registration Application as provided for in § 47.31(c). Section 91.203(b) prescribes, in pertinent part, that no person may operate a civil aircraft unless the airworthiness certificate 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.

Identified Technologies requests an exemption from 14 CFR 91.203(a) and (b). First, there currently are no procedures set forth by the FAA for providing airworthiness certificates for sUAS. As a condition to the approval of exemption, however, Identified Technologies will display on the sUAS a registration certificate or equivalent that is issued by FAA pursuant to this petition at the ground point control, where the operator will have immediate access to it.

Second, the sUAS Identified Technologies will use the Boomerang, which has an equivalent level of safety as manned aircraft with an airworthiness certificate. The PixHawk flight controller provides a number of safety features in addition to acting as the command and control Rx bound to the Turnigy TGY 9x brand Tx. Because of the use of GPS with the sUAS, the operator will set the initial location of flight takeoff ("home position") and if the radio control link is broken, the PixHawk flight controller will recognize this broken control link and cause the sUAS to automatically return to the home position as recorded by the GPS instrumentation. Additionally, because the sUAS team will mark off an area with traffic cones having a 20-ft. radius, approximately 30 ft. from the operators, that will be used as the "home position" for the sUAS to return, no one will be standing in the way of the path. *See* Exhibits A and B.

In the restricted environment and under the conditions proposed, operation of the sUAS will be at least as safe as a conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate, but without the restrictions and conditions proposed by Identified Technologies. Identified Technologies will not accept assignments from clients who are within 5

miles of controlled airspace without first gaining written and/or oral permission from air traffic control (ATC).

The Identified System to be operated hereunder is less than 5 pounds inclusive of batteries and technical payload, carries neither a pilot nor passengers, and carries no explosive materials or flammable liquid fuels. The Identified System will be tightly controlled and monitored by the PIC and VO, and under the requirements and in compliance with local public safety requirements, to provide security for the area of operation. The FAA will have advance notice of all operations. These safety enhancements provide a greater degree of safety to the public and property owners than conventional operations conducted with airworthiness certificates. Lastly, application of these same criteria demonstrates that there is no credible threat to national security posed by the Identified System, due to its size, speed of operation, location of operation, lack of explosive materials or flammable liquid fuels, and inability to carry a substantial payload.

T. 14 CFR 91.405(a) Maintenance Required, 91.407(a)(1) Operation after maintenance, preventive maintenance, rebuilding, or alteration, 91.409(a)(2) Inspections, 91.-417(a) and (b) Maintenance Records—Section 91.405(a) prescribes, in pertinent part, that each 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, Maintenance, Preventive, Maintenance, Rebuilding, and Alteration. Section 91.407(a)(1) prescribes that no person may operate any aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless it has been approved for return to service by a person authorized under § 43.7 of this chapter. Section 91.409(a)(2) prescribes, in pertinent part, that no person may operate an aircraft unless, within the preceding 12 calendar months, it has had an inspection for the issuance of an airworthiness certificate in accordance with part 21. Section 91.417(a) and (b) prescribe, in pertinent part, that … (a) Each registered owner or operator shall keep the following records for the periods specified in paragraph (b) of this section: (1) Records of the maintenance, preventive maintenance, and alteration and records of the 100-hour, annual, progressive, and other required or approved inspections, as appropriate, for each aircraft (including the airframe) and each engine, propeller, rotor, and appliance of an aircraft. The records must include … (i) a description (or reference to data acceptable to the Administrator) of the work performed; (ii) the date of completion of the work performed; and (iii) the signature and certificate number of the person approving the aircraft for return to service. (2) Records containing the following information: (i) The total time in service of the airframe, each engine, each propeller, and each rotor. (ii) The current status of life-limited parts of each airframe, engine, propeller, rotor, and appliance. (iii) The time since last overhaul of all items installed on the aircraft that are required to be overhauled on a specified time basis. (iv) The current inspection status of the aircraft, including the time since the last inspection required by the inspection program under which the aircraft and its appliances are maintained. (v) The current status of applicable airworthiness directives (AD) and safety directives including, for each, the method of compliance, the AD or safety directive number and revision date. If the AD or safety directive involves recurring action, the time and date when the next action is required. (vi) Copies of the forms prescribed by § 43.9(d) for each major alteration to

> the airframe and currently installed engines, rotors, propellers, and appliances. (b) The owner or operator shall retain the following records for the periods prescribed: (1) The records specified in paragraph (a)(1) of this section shall be retained until the work is repeated or superseded by other work or for 1 year after the work is performed. (2) The records specified in paragraph (a)(2) of this section shall be retained and transferred with the aircraft at the time the aircraft is sold. (3) A list of defects furnished to a registered owner or operator under § 43.11 shall be retained until the defects are repaired and the aircraft is approved for return to service.

Identified Technologies requests an exemption from 14 CFR 91.405(a), 91.407(a)(1), 91.409(a)(2), 91.-417(a) and (b). Identified Technologies respectfully submits that it has demonstrated in its Petition that the capability of the PIC and sUAS operators to maintain and repair the Identified System meets Section 333's requirement for an equivalent level of safety. The PIC will perform routine maintenance and inspection of the Identified System and be authorized to approve the Identified System for return to service. Additionally, the PIC will ensure that the Identified System is in an airworthy condition prior to any flight, and will conduct detailed inspections pursuant to the maintenance manuals. Detailed inspection records will be kept at all times by Identified Technologies. Given the size, construction, and simplicity of the Identified System, an equivalent level of safety is provided.

X. Certificate of Authorization or Waiver

This exemption request is a prerequisite to Identified Technologies' application for a commercial Certificate of Authorization or Waiver (COA) to use the Identified System for the purpose of conducting aerial surveys and monitoring of secure project sites in support of the civil engineering industry, including without limitation construction, excavation, transportation infrastructure, mining, and oil and gas sites.

XI. Conclusion

Identified Technologies respectfully submits that it has demonstrated that (i) the Identified System is safe, reliable and will satisfy the FAA's airworthiness assessment, (ii) the Pilot in Command (PIC) and visual observer (VO) have the requisite knowledge and experience to ensure the safe operation of the Identified System, (iii) Identified Technologies has developed and complies with operation procedures and parameters that further ensure safe sUAS operations in the national airspace, removing any legitimate the threat of harm to humans and property, including other manned aircraft, and (iv) Identified Technologies' proposed operations, which include without limitation, the use of the Identified System to conduct aerial imaging, monitoring and surveying of secure project sites for the benefit of the civil engineering industry, achieve a level of safety equal to or greater than that which would be achieved by flying a larger manned aircraft carrying crew and flammable fuel for the same purposes. In addition, permitting use of the Identified System will achieve various economic and environmental benefits, as well as significant efficiencies, associated with cost, labor and safety, that serve the public interest.

Identified Technologies asks that the FAA grant its request for exemption from the afore-described FARs under Section 333, and approve its operation of the Identified System in the national airspace in accordance with the limitations and restrictions set forth herein.