



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

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

July 9, 2015

Exemption No. 12000  
Regulatory Docket No. FAA-2015-0327

Mr. Eric DaVersa  
CEO  
Integra Tower, LLC  
11771 Spruce Run DR  
San Diego, CA 92131

Dear Mr. DaVersa:

This letter is to inform you that we have granted your request for exemption. It transmits our decision, explains its basis, and gives you the conditions and limitations of the exemption, including the date it ends.

By letter dated June 10, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Integra Tower, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial infrastructure and surveys for the tower, bridge, utility, and building construction and maintenance industries.

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 are the DJI Phantom 2 Vision+, DJI Inspire 1, and SteadiDrone MAVRIK X8.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112–95 in reference to 49 U.S.C. § 44704, and in consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

### **The Basis for Our Decision**

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

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

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

### **Our Decision**

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, Integra Tower, LLC is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to

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

the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

### **Conditions and Limitations**

In this grant of exemption, Integra Tower, LLC is hereafter referred to as the operator.

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

1. Operations authorized by this grant of exemption are limited to the DJI Phantom 2 Vision+, DJI Inspire1, and SteadiDrone MAVRIK X8 when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.
2. Operations for the purpose of closed-set motion picture and television filming are not permitted.
3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.
4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude must be reported in feet AGL.
5. The UA must be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate or U.S. driver's license.
6. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. The VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.
7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating

documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents, the conditions and limitations herein take precedence and must be followed.

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

8. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g., replacement of a flight critical component, must undergo a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.
9. The operator is responsible for maintaining and inspecting the UAS to ensure that it is in a condition for safe operation.
10. Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, e.g., inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.
11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.
12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.
13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal

government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.
15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.
16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.
17. The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.
18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.
19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.
20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.
21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The

exemption holder may apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N-Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.
23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.
24. The UA must remain clear and give way to all manned aviation operations and activities at all times.
25. The UAS may not be operated by the PIC from any moving device or vehicle.
26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
  - a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and
  - b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

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

27. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative. Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.
28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS-80) within 24 hours. Accidents must be

reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: [www.nts.gov](http://www.nts.gov).

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

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.
30. At least 3 days before aerial filming, the operator of the UAS affected by this exemption must submit a written Plan of Activities to the local Flight Standards District Office (FSDO) with jurisdiction over the area of proposed filming. The 3-day notification may be waived with the concurrence of the FSDO. The plan of activities must include at least the following:
  - a. Dates and times for all flights;
  - b. Name and phone number of the operator for the UAS aerial filming conducted under this grant of exemption;
  - c. Name and phone number of the person responsible for the on-scene operation of the UAS;
  - d. Make, model, and serial or N-Number of UAS to be used;
  - e. Name and certificate number of UAS PICs involved in the aerial filming;
  - f. A statement that the operator has obtained permission from property owners and/or local officials to conduct the filming production event; the list of those who gave permission must be made available to the inspector upon request;
  - g. Signature of exemption holder or representative; and
  - h. A description of the flight activity, including maps or diagrams of any area, city, town, county, and/or state over which filming will be conducted and the altitudes essential to accomplish the operation.
31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

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

This exemption terminates on July 31, 2017, unless sooner superseded or rescinded.

Sincerely,

/s/

John S. Duncan

Director, Flight Standards Service

Enclosures





January 30, 2015

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

Re: Exemption Request Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations from 14 C.F.R. 45.23(b); 14 CFR Part 21; 14 CFR 61.3(a) & (c); 61.113(a) & (b); 91.7 (a); 91.9 (b) (2); 91.103(b); 91.109; 91.119; 91.121; 91.151(a); 91.203(a) & (b); 91.405 (a); 91.407(a) (1 ); 91.409 (a) (2); 91.417 (a) & (b).

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11, Integra Tower, LLC, (heretofore "Integra") an operator of Small Unmanned Aircraft Systems (sUAS) equipped to conduct aerial infrastructure inspections and surveys for the tower, bridge, utility, and building construction and maintenance industries hereby applies for an exemption from the listed Federal Aviation Regulations (FARs) to allow commercial operation of its sUAS, so long as such operations are conducted within and under the conditions outlined herein or as may be established by the FAA as required by Section 333.1

As described in detail below, the requested exemption would permit the operation of small, unmanned and relatively inexpensive sUAS under controlled conditions in airspace that is 1) limited, 2) predetermined, 3) has controlled access, and 4) provides enhanced safety advancements to hazardous inspection and surveying work currently performed manually. Approval of this exemption would enhance safety and eliminate workplace accidents and deaths for these industrial tasks. This meets the requirements in 14 CFR Part 11.81 as being in the public interest as well as not adversely affecting safety.

The name and address of the Applicant is:

Integra Tower, LLC  
Attn: Eric DaVersa  
Phone: (858) 245-6702  
Email: [eric@integratower.com](mailto:eric@integratower.com)  
Address: 11771 Spruce Run Dr, San Diego, CA 92131

Regulations from which the exemption is requested:

14 CFR Part 21  
14 CFR 45.23(b)  
14 CFR 61.3(a) & (c)  
14 CFR 61.113 (a) & (b)  
14 CFR 91.7 (a)  
14 CFR 91.9 (b) (2)  
14 CFR 91.103  
14 CFR 91.109  
14 CFR 91.119  
14 CFR 91.121  
14 CFR 91.151 (a)  
14 CFR 91.203 (a) & (b)  
14 CFR 91.405 (a)  
14 CFR 407 (a) (1)  
14 CFR 409 (a) (2)  
14 CFR 417 (a) & (b)

This exemption application is expressly submitted to fulfill Congress' goal in passing Section 333(a) through (c) of the Reform Act. This law directs the Secretary of Transportation to consider whether certain unmanned aircraft systems may operate safely in the national airspace system (NAS) before completion of the rulemaking required under Section 332 of the Reform Act. In making this determination, the Secretary is required to determine which types of UAS 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). Lastly, 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)<sup>1</sup>.

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, that includes sUAS, from the requirement that all civil aircraft must have a current airworthiness certificate.

The Administrator may grant an exemption from a requirement of a regulation prescribed under subsection (a) or (b) of this section or any sections 44702-44716 of this title if the Administrator finds the exemption in the public interest. 49 U.S.C. §44701 (f) See also 49 USC §44711(a); 49 USC §44704; 14 CFR §91.203 (a) (1).

Integra uses sUAS that are rotorcraft, weighing 55 or fewer lbs. including payload. They operate, under normal conditions at a speed of no more than 2 knots and have the capability to hover, and move in the vertical and horizontal plane simultaneously. The sUAS will operate only within the sterile area described in

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<sup>1</sup> Applicant interprets this provision to place the duty on the Administrator to not only process applications for exemptions under section 333, but for the Administrator to craft conditions for the safe operation of the sUAS.

the Confidential Flight Operations and Procedures, (hereinafter "the Manual")<sup>2</sup>. Such operations will ensure that the sUAS will "not create a hazard to users of the national airspace system or the public."<sup>3</sup>

Given the small size of the sUAS involved, the "electronic fence", the industrial environment in which the sUAS is designed to operate, and the structural "shield" created by an existing obstacle, the Applicant falls squarely within that zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of sUAS to commence immediately. Also, due to the size of the sUAS and the restricted areas in which the relevant sUAS will operate, approval of the application presents no national security issue. Given the clear direction in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, as amended; the strong equivalent level of safety surrounding the proposed operations, *and the significant public benefit, including enhanced workplace personal safety, more frequent infrastructure inspections leading to enhanced industrial maintenance and safety, the grant of the requested exemptions is in the public interest.* Accordingly, the Applicant respectfully requests that the FAA grant the requested exemption without delay.

## AIRCRAFT AND EQUIVALENT LEVEL OF SAFETY

The Applicant 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 level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to workforce personal safety for certain types of industrial inspection and surveying work.

These limitations and conditions to which Integra agrees to be bound when conducting commercial operations under an FAA issued exemption include:

1. The sUAS will weigh approximately 10 lbs. in most flight and payload configurations, but no more than 55 lbs.
2. Flights will be operated within line of sight of the operator technician.
3. Flights will be operated at a typical altitude of 40 – 250 feet, but no more than 400 feet AGL.
4. The sUAS will only operate within a confined "safety perimeter" as defined in the Manual. Safety cones and/or tape will define the safety perimeter when operating in areas that could pose a hazard to the general public. Integra will post signage on site indicating aircraft audit/inspection in progress along with appropriate company contact information.
5. A briefing will be conducted in regard to the planned sUAS operations prior to each day's inspection activities. It will be mandatory that all personnel who will be performing duties within the boundaries of the safety perimeter be present for this briefing.
6. As with any other industrial workplace setting, appropriate safety gear will be worn by all personnel within the safety perimeter including, but not limited to, hardhats and brightly colored safety vests, and all personnel will have completed OSHA-10 certification at a minimum.
7. Each operator technician will have been trained in operation of sUAS and received up-to-date information on the particular sUAS to be operated as required in Section E of the Manual.

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<sup>2</sup> Applicant will submit this Manual as a Confidential document under 14 CFR 11.35 (b) as the entire manual contains proprietary information that the Applicant has not and will not share with others. The Manual contains operating conditions and procedures that are not available to the public and are protected from release under the Freedom of Information Act 5 USC 552 et.seq. Reform Act Section 333 (b).

<sup>3</sup> Reform Act § 333 (b).

8. Operator technician and other workers within the safety perimeter will at all times be able to communicate by voice or hand signals.
9. Written and/or oral permission from the relevant property holders will be obtained.
10. 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 for the work being done on site.
11. If the sUAS loses communications or loses its GPS signal, the sUAS will have capability to return to a pre-determined location within the Security Perimeter and land.
12. The sUAS and operator will have the capability to abort a flight in case of unpredicted obstacles or emergencies.
13. The operator will obtain a FAA Form 7711-1, or its equivalent, as modified in light of the requested exemption, with the appropriate Air Traffic Organization for certain sUAS operations that are substantially outside the immediate shielding vicinity of tower, bridge, or building work locations

## **TECHNICAL/OPERATIONAL LIMITATIONS AND PUBLIC SAFETY**

Another aspect relating to public safety in regards to the operation of the Applicants sUAS is the environment in which it is designed to operate. The sUAS does not pose a hazard to other aircraft in the vicinity when performing its intended mission, which is a close-range inspection of various infrastructure assets such as towers, bridges, and buildings. The "electronic fence" combined with the close proximity in which the proposed surveys are done, almost certainly means that the tower, bridge, or building under inspection by the sUAS is an equal, or even more hazardous obstacle to passing aircraft than the sUAS itself. The Applicant's proposal is to operate "shielded by existing structures of a permanent and substantial character"<sup>4</sup>.

Finally, the location of the various infrastructure assets at which the sUAS operates are generally not in publicly accessible places. Much of the infrastructure is on private property, behind fences, in remote sparsely populated locations, or in industrial settings that are not open to the public. The safety procedures described in the Manual, combined with the limitations and conditions outlined above would provide an equivalent level of public safety for the operation in the NAS.

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

Subpart H, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR §91.203 (a) (1). Given the size and limited operating area associated with the aircraft to be utilized by the Applicant, an exemption from Part 21 Subpart H meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act. The Federal Aviation Act (49 U.S.C. §44701 (f)) and Section 333 of the Reform Act both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular sUAS. In all cases, an analysis of these criteria demonstrates that the sUAS operated without an airworthiness certificate, in the restricted environment and under the conditions proposed will be at least as safe, or safer, than a conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate without the restrictions and conditions proposed.

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<sup>4</sup> 14 CFR §77.15

The sUAS to be operated hereunder is less than 55 lbs. fully loaded, carries neither a pilot nor passenger, carries no explosive materials nor flammable liquid fuels, and operates exclusively within a secured area as described in the Manual. Unlike other civil aircraft, operations under this exemption will be tightly controlled and monitored by the operator, pursuant to the Manual's requirements, and under the requirements and in compliance with local public safety requirements when in operation where the general public could be a factor. The FAA will have advance notice of all operations where the sUAS is operating outside the immediate vicinity of an existing tower, bridge, or building. Lastly, application of these same criteria demonstrates that there is no credible threat to national security posed by the sUAS, due to its size, speed of operation, location of operation, "fenced" limited range, lack of explosive materials or flammable liquid fuels, and inability to carry a substantial external load.

#### **14 C.F.R. § 45.23 {b). Marking of the Aircraft**

The regulation requires:

When marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted or 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. Even though the sUAS will have no airworthiness certificate, an exemption may be needed 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. However, Integra will post the registration number in a size as large as practicable. The word "Experimental" will be placed on the fuselage in compliance with §45.29 (f).

The equivalent level of safety will be provided by having the sUAS marked on its fuselage as required by §45.29 (f) where the pilot, observer and others working with the sUAS will see the identification of the sUAS as "Experimental." The FAA has issued the following exemptions to this regulation to Exemptions Nos. 10700, 8738, 10167 and 10167 A.

#### **14 C.F.R. §61.3(a) and {c): Requirements for certificates, ratings, and authorizations.**

Section 61.3 (a) & (c) requires that a person must possess a valid pilot certificate as well as an appropriate medical certificate in order to act as pilot in command of a civil aircraft.

The equivalent level of safety will be maintained by equipment-specific training and knowledge for the sUAS as outlined in the Manual Section E. The training combined with the Integra pilot vetting process, we feel will exceed the equivalent level of safety required by the current regulations. We contend pilots that have learned flying techniques in manned aircraft have a potentially negative transfer when operating small sUAS. Therefore, by initially flying models and sUAS the operator can positively "practice" on the ground with acute attention on "external operation" unique to sUAS operations then transfer that into manned training. The amount of training will be sufficient for operators to understand the level of safety required to operate in the NAS safely. All flights will be "dispatched" with in-house flight following procedures as outlined in section E in the Manual. We will require that all operators/observers are required to complete a rigorous training course as outlined in the Manual:

- 5\* hours dual instruction fixed wing model aircraft with successful solo
- 5\* hours dual instruction multirotor aircraft with successful solo
- 15 hours solo quad/airplane
- 5 hours instruction programming sUAS

- 5 hours trouble shooting sUAS
- 10 hours of dual instruction in manned aircraft from a certificated flight instructor
- 25 hours ground training for Pvt. Pilot Written Exam
- 80% or better corrected to 100% on Pvt. Pilot Written Exam
- III class medical certificate

*\*3 hours may be on pc based synthetic trainer.*

Integra is open to finding a workable solution that puts this sUAS inspection tool into the hands of trained survey and inspection technicians without requiring every field level technician to become a certified pilot. If the request to operate without private pilot certification is denied, Integra will operate with persons that hold a private pilot certificate.

#### **14 C.F.R. § 61.113 (a) & (b): Private Pilot Privileges and Limitations: Pilot in Command.**

Sections 61.113 (a) & (b) limit private pilots to non-commercial operations. If an exemption is denied for section 61.3(a) and (b) mentioned above, then because the sUAS will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations by requiring the PIC operating the aircraft to have a private pilot's license rather than a commercial pilot's license to operate this sUAS. Unlike a conventional aircraft that carries the pilot and passengers, the sUAS is remotely controlled with no living thing on board. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance as set forth in the Manual. The level of safety provided by the requirements included in the Manual exceeds that provided by a single individual holding a commercial pilot's certificate operating a conventional aircraft. The risks associated with the operation of the sUAS are so diminished from the level of risk associated with commercial operations contemplated by Part 61 when drafted, that allowing operations of the sUAS as requested with a private pilot as the PIC exceeds the present level of safety achieved by 14 C.F.R. §61.113 (a) & (b).

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

The regulation requires that no person may operate a civil aircraft unless it is in airworthy condition. As there will be no airworthiness certificate issued for the aircraft, should this exemption be granted, no FAA regulatory standard will exist for determining airworthiness. Given the size of the aircraft and the requirements contained in the Manual for maintenance and use of safety check lists prior to each flight, an equivalent level of safety will be provided.

#### **14 C.F.R. § 91.9 (b) (2): Civil Aircraft Flight Manual in the Aircraft.**

Section 91.9 (b) (2) provides:

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

(2) For which an Airplane or Rotorcraft Flight manual is not required by §21.5 of this chapter, unless there is available in the aircraft a current approved airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

The sUAS, given its size and configuration, has no ability or place to carry such a flight manual on the aircraft, not only because there is no pilot on board, but because there is no room or capacity to carry such an item on the aircraft.

The equivalent level of safety will be maintained by keeping the flight manual at the ground control point where the operator flying the sUAS will have immediate access to it. The FAA has issued the following exemptions to this regulation: Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 95658, 10167, 10167A, 10602, 32827, and 10700.

#### **14 C.F.R. § 91.103: Preflight action**

This regulation requires each pilot in command to take certain actions before flight to insure the safety of flight. As FAA approved flight manuals will not be provided for the aircraft an exemption will be needed, an equivalent level of safety will be provided as set forth in the Manual. The operator will take all actions including reviewing weather, power source requirements, landing and takeoff distances and aircraft performance data before initiation of flight.

#### **14 C.F.R. §91.109: Flight instruction:**

Section 91.103 provides that no person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls.

sUAS and remotely piloted aircraft, by their design, do not have fully functional dual controls. Primary flight control is accomplished through the use of a control box that communicates with the aircraft via radio communications. The Manual outlines procedures for new operator training and certification using a single set of controls during instruction. The FAA has approved exemptions for flight training without fully functional dual controls for a number of aircraft and for flight instruction in experimental aircraft. See Exemption Nos.5778K & 9862A. The equivalent level of safety provided by the fact that neither a pilot nor passengers will be carried in the aircraft and by the size and speed of the aircraft.

#### **14 C.F.R. §91.119: Minimum safe altitudes**

Section 91.119 establishes safe altitudes for operation of civil aircraft. The Exemption requests authority to operate at altitudes from 0 AGL up to 400 AGL, an exemption may be needed to allow such operations. As set forth herein, the sUAS will never operate at higher than 400 AGL. It will however be operated in restricted areas with a safety perimeter, where the general public will not be exposed to operations.

The equivalent level of safety will be achieved given the size, weight, speed of the sUAS as well as the location where it is operated. No flight will be taken without the permission of the property owner. Because of the advance notice to the property owner and participants in the inspection activity, all affected individuals will be aware of the planned flight operations as set forth in Section C of the Manual. Compared to flight operations with aircraft or rotorcraft weighing far more than the maximum 55lbs. proposed herein and the lack of flammable fuel, any risk associated with these operations is far less than those presently presented with conventional aircraft operating at or below 500 AGL in surveying and inspection work. In addition, the low-altitude operations of the sUAS will ensure separation between these small-UAS operations and the operations of conventional aircraft that must comply with Section 91.119.



#### **14 C.F.R. §91.121 Altimeter Settings**

This regulation requires each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "... to the elevation of the departure airport or an appropriate altimeter setting available before departure." As the sUAS may only have a digital barometric sensor and/or a GPS altitude read out, an exemption may be needed. An equivalent level of safety will be achieved by the operator, pursuant to the Manual and Preflight Checklist, confirming the altitude of the launch site shown on the ground station altitude indicator before flight.

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

Section 91.151 (a) prohibits an individual from beginning "a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing, and, assuming normal cruising speed - (1) During the day, to fly after that for at least 30 minutes; or (2) At night, to fly after that for at least 45 minutes."

Given the limitations on the sUAS proposed flight area and the location of its proposed operations within a predetermined area, a 30 minute fuel reserve for flight in daylight is reasonable.

Integra's sUAS operations will be conducted in a controlled closed-perimeter environment, with UA under 55 pounds, at speeds below 50 Knots, and within VLOS. Integra intends to terminate flights after 30 minutes or with 25% remaining battery power (whichever occurs first). Integra believes this provides an equivalent level of safety and is practical considering the limited power supply available for operations. Limiting flights to thirty minutes would greatly reduce the operational utility of the platform.

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

The regulation provides in pertinent part:

(a) Except as provided in § 91.715, no person may operate a civil aircraft unless it has within it the following:

(1) An appropriate and current airworthiness certificate....

(b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under §91. 715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

The sUAS fully loaded weighs no more than 55 lbs. and is operated without an onboard pilot. As such, there is no ability or place to carry certification and registration documents or to display them on the sUAS.

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

#### **14 C.F.R. §91.405 (a); 407 (a) (1); 409 (a) (2); 417(a) & (b): Maintenance Inspections**

These regulations require that an aircraft operator or owner "shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph



(c) of this section, have discrepancies repaired as prescribed in part 43 of this chapter..., " and others shall inspect or maintain the aircraft in compliance with Part 43.

Given that these sections and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply to the Applicant. Maintenance will be accomplished by the operator pursuant to the Flight Operations and Procedures as referenced in the Manual. An equivalent level of safety will be achieved because these small sUAS are very limited in size and will carry a small payload and operate only in restricted areas for limited periods of time. If mechanical issues arise the sUAS can land immediately and will be operating from no higher than 400 feet AGL. As provided in the Manual, the operator will ensure that the sUAS is in working order prior to initiating flight, perform required basic maintenance, and keep a log of any maintenance performed. Moreover, the operator is the person most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety.

Satisfaction of the criteria provided in Section 333 of the Reform Act of 2012--size, weight, speed, operating capabilities, proximity to airports and populated areas and operation within visual line of sight and national security - provide more than adequate justification for the grant of the requested exemptions allowing commercial operation of Applicant's sUAS in the infrastructure inspection survey industry pursuant to the Manual.

Sincerely,

Eric DaVersa  
CEO  
Integra Tower, LLC

