



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

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

September 24, 2015

Exemption No. 12978
Regulatory Docket No. FAA-2015-2755

Mr. David Gan
TopGan Drones LLC
17495 Avenida Peregrina
P.O. Box 7129
Rancho Santa Fe, CA 92067

Dear Mr. Gan:

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 May 26, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of TopGan Drones LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial imaging, inspecting, mapping, and monitoring.

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 3 and DJI S1000.

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 collection¹. 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, TopGan Drones 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

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.

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, TopGan Drones 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 3 and DJI S1000 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.

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 October 31, 2017, unless sooner superseded or rescinded.

Sincerely,

/s/

John S. Duncan

Director, Flight Standards Service

Enclosures



TopGan Drones LLC

EXEMPTION OF
OPERATIONS
FROM THE
FAA MODERNIZATION
REFORM ACT OF 2012

NO 32-7 A 11:30

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May 26, 2015

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U.S. Department of Transportation

Docket Management System

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Washington, DC 20590

Re: Exemption Request Pursuant to Section 33 of the FAA Modernization

Reform Act of 2012, 49 U.S.C. §§ 44701(f), and 14 C.F.R. 45.23(b); 14

C.F.R. Part 21; 14 C.F.R. 61.113(a),(b); 91.7(a); 91.9(b) (2); 91.103(b); 91.109;

119.121; 91.151(a); 91.203(a),(b); 91.405(a); 91.407(a)(1); 91.409(a)(2);

91.417(a),(b) sought by TopGan Drones LLC,

5/26/2015 *DAVID GAN*



Dear Sir or Madam:

Pursuant to the FAA Modernization and Reform Act of 2012 and to procedures administered by the Department under/within 14 C.F.R. 11, TopGan Drones LLC

("TopGan Drones LLC"), a limited liability company organized under the laws of the state of Delaware and owner and operator of small unmanned aircraft, requests exemption from Federal Aviation Regulations ("FARs") as stated below. Said request for exemption tendered in order that TopGan Drones LLC may operate its small ultra lightweight unmanned aircraft systems (s "UAS") commercially in airspace regulated by the Federal Aviation Administration (FAA). This exemption request is exclusively for the use of UAS manufactured by DJI (Phantom 3 and S1000 UAS aircraft) and for operations conducted within and under the conditions outlined herein or as may be further established by the FAA as required by § 333.

The exemption sought hereof is to permit the operation of UAS under controlled conditions in airspace that is limited, predetermined, controlled as to access: specifically, to allow petitioner to supply drone coverage to: 1) monitor precision agriculture and/or irrigation operations; 2) maintain aerial assay of the operations and physical integrity of commercial drilling and/or excavating devices ; 3) maintain aerial imaging and/or monitoring of devices and/or materials integral to oil and gas pipeline operations; 4) maintain aerial imaging and/or monitoring by which power line and cable inspection(s) may be expedited; 5) maintain aerial imaging by which solar panel inspection(s) might be expedited; 6) maintain aerial operations by which wind turbine operations may be expeditiously inspected; and 7) facilitate aerial mapping and/or graphic imaging by which navigational or other devices may maintain and/or adjust course.

Regulations from which the exemption is requested:

14 C.F.R. Part 21

14 C.F.R. 45.23(b)

14 C.F.R. 61.113 (a) & (b)

14 C.F.R. 91.7 (a)

14 C.F.R. 91.9 (b) (2)

14 C.F.R. 91.103



14 C.F.R. 91.109

14 C.F.R. 91.119

14 C.F.R. 91.121

14 C.F.R. 91.151 (a)

14 C.F.R. 91.203 (a) & (b)

Granting the exemption sought by TopGan Drones LLC is in furtherance of the public interest for reasons which are detailed below and include, but are not limited to: 1) safety benefits following from ultra light battery powered remotely controlled and electronically guided unmanned aerial surveillance drones operating safely within the National Airspace System ("NAS") replacing operations currently conducted by manned aircraft carrying combustible fuel (viz. aircraft posing danger of flammable mid-air collisions with manned and other aerial vehicles operating within the NAS); 2) the significantly lessened, or altogether averted, possibility of damage(s) to life and property in the instance of aerial crash landings involving aircraft powered by flammable fuels; 3) significant reduction in the environmental impact from operations presently performed or carried out by conventional aircraft; 4) improved visual access to land based and/or underground operations in off-limits areas or areas hard to reach by conventional aerial means; 5) providing a more cost efficient/effective means for information gathering and/or monitoring relative to drilling, pipeline and excavation processes via mechanisms more sensitive and precise; and 6) advancing United States national security interests via better and more accurate monitoring of critical national infrastructure (pipelines, power lines, cable and other reticulated/networked services and/or utilities integral to the operation of national economic lifelines and/or grids);



I. STATUTORY AUTHORITY FOR EXEMPTIONS

The Federal Aviation Act expressly grants the FAA authority to issue exemptions. This statutory authority includes exempting civil aircraft, as the term is defined under §40101 of the Act, including UAS, 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). Section 333(b) of the Reform Act informs the Secretary as to criteria determining whether UAS may operate in the National Airspace System (NAS) without creating a hazard to the user, the public, or a threat to national security. In making this determination, the Secretary must consider:

- The UAS's size, weight, speed, and operational capability;
- Whether the UAS operates within the visual line of sight of the operator

Whether the UAS operates outside of highly populated areas and away from close proximity to airports Reform Act §333(a).

If the Secretary determines that a UAS "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). TopGan Drones LLC sUAS are multi rotor vehicles, weighting 20 or fewer lbs. including payload. They operate under normal conditions at a speed of no more than 50 knots and have the capability to hover, and move in the vertical and horizontal plane simultaneously. The UAS will operate only in the pilot's visual line of sight at all times and will operate only within the recommendations described in the DJI Flight Manual, Such operations will insure that the UAS will "not create a hazard to users of the national airspace system or the public." Reform Act Section 333 (b).

Given the small size of the UAS involved and the restricted, essentially unpopulated and sterile environments within which they will operate, TopGan Drones LLC application falls hereof squarely within the zone of safety which Congress envisioned as the standard for exemptions permitting commercial operations of sUAS. Also due to the small size of the sUAS and the low altitudes and restricted areas in which the craft 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 or improved level of safety which will be resultant from the proposed operations the grant of the requested exemptions is in the public interest. Accordingly, TopGan Drones LLC respectfully requests that its exemption be granted expeditiously.



II. PUBLIC INTEREST

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 NAS before completion of the rule making required under Section 332 of the Reform Act. By granting an exemption the FAA will fulfill Congress's intent of allowing UAS to operate with significant safety precautions in low risk environments. The use of UAS on a construction or inspection site can significantly reduce the risk to workers of falls while inspecting, surveying, or monitoring site progress. UAS can inspect, photograph, and collect data on hard to get to areas that otherwise would require worker inspection. Falls are the leading source of workplace fatality and injury on construction sites', and reducing falls through UAS use for site imaging could save workers lives. Additionally, UAS could replace the use of helicopters and small aircraft to monitor sites. The UAS we propose to fly in this application are under twenty pounds, and carry no combustible material on board, as opposed to the much larger conventionally powered small aircraft. Shifting to UAS from helicopters presents a marked safety increase for the public. Moreover, TopGan Drones LLC sUAS demonstrably reduce the negative environmental effects and economic externalities of visual monitoring operations presently conducted by conventional aircraft and/or helicopters

III. EQUIVALENT LEVEL OF SAFETY

TopGan Drones LLC will be bound by the following limitations in the course of conducting UAS operations in accordance with the exemption sought hereof:

1. Drones operated will weigh (inclusive of payload(s)) less than 20 pounds
2. Flights will be operated within visual line of sight of Pilot(s) in Command (PIC) and monitored by visual observers at all times of operation
3. Maximum total flight time for each operational flight will be less than thirty minutes – for the DJI Phantom 3, no longer than 25-27 minutes, for the S1000 no longer than 20 minutes. TopGan Drones LLC sUAS calculate battery reserve(s) in real time and our sUAS,



within the capacity of existing software systems adapted, will return to ground station automatically with at least ...% battery power reserve within the limits of operations for which exemption is sought (see Flight Manual attached as Appendix ...)

4. Flights will be conducted at heights no greater than 200 feet AGL
5. Crew for each operation will consist of the UAS pilot who will keep the UAS within his visual line of sight at all times and a Visual Observer (VO)
6. The UAS PIC will be trained in flight and safety procedures as detailed below and in The DJI Manual (Appendix ...)
7. The sUAS will only operate only within confined areas as described/identified herein
8. Individualized briefings (including specifying further safety procedures) will be conducted prior each day's production activities.
9. All pilots (PICs) will have been trained in the operation of UAS generally and will receive up to date information (and/or data, and/or relevant graphic material) relative to particular sUAS and operations contemplated.
10. Required permissions (and/or permits) will be obtained from relevant jurisdictions and governing bodies consistent with public policy and valid operative regulation
11. Should the sUAS lose communications or GPS signal, both Phantom 3 and S1000 systems have the capabilities to return automatically to a predetermined location or locations designated.



IV. DESCRIPTION OF SPECIFIC REGULATIONS

14 CFR Part 21, Subpart H: Airworthiness Certificates 14 C.F.R. §91203(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 TopGan Drones LLC, 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 UAS. Our small UAS will be operated at low speed in a controlled environment, at least five miles from an airport and more than three miles from any city or densely populated area. An analysis of these criteria demonstrates that the UAS 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 helicopter) operating with an airworthiness certificate without the restrictions and conditions proposed.

The UAS to be operated hereunder is less than 20 lbs. fully loaded, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a secured area as set out in this document and the DJI manual . Like other civil aircraft, operations under this exemption will be tightly controlled and monitored by the operator, pursuant to this document and the DJI Manual's requirements, and under the requirements and in compliance with local public safety requirements, to provide security for the area of operation as is currently done on active construction sites. These safety enhancements, which already apply to civil aircraft operated in connection with construction sites, provide a greater degree of safety to the public and property owners than conventional operations conducted with airworthiness certificates issued under 14 C.F.R. Part 21, Subpart H. Lastly, application of these same criteria demonstrates that there is no credible threat to national security posed by the UAS, due to its size, speed of operation, location of operation, lack of explosive materials or flammable liquid fuels, and ability to carry an external load no greater than three lbs.



14 C.F.R. 45.23(b): Marking of the Aircraft

This regulation requires certain experimental, provisionally certificated aircraft, or light-sport category aircraft to be marked with letters between 2 inches and 6 inches high "limited," "restricted," "light-sport," "experimental," or "provisional," near each entrance to a cabin, cockpit, or pilot station. Even though the UAS will have no airworthiness certificate, an exemption may be needed as the UAS will have no entrance to the cabin, cockpit or pilot station on which the word "Experimental" can be placed. Given the size of the UAS, two-inch lettering will be impossible. 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 UAS marked on its fuselage as required by §45.29 (f) where the pilot, observer and others working with the UAS will see the identification of the UAS as "Experimental." The FAA has issued the following exemptions to this regulation: Exemptions Nos. 11660, 10700, 8738, 10167 and 10167A.



14 CFR 61.113 (a) & (b): Private pilot privileges and limitations: Pilot in command

Sections 61.113 (a) & (b) limit private pilots to non-commercial operations. Because the UAS will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations by requiring the pilot operating the aircraft to have completed a UAS flight training course of 10 hours before flying a UAS. Unlike a conventional aircraft that carries the pilot and passengers, the UAS is remotely controlled with no living thing or cargo on board. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance as set forth in this document. The risks associated with the operation of the UAS are so diminished from the level of risk associated with commercial operations contemplated by Part 61 when drafted, that allowing operations of the UAS as requested with a pilot who has met the minimum requirements of this document 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 above 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 DJI Manual for maintenance and use of safety checklists prior to each flight, as set forth in this document, an equivalent level of safety will be provided.

14 CFR 91.9 (b)(2): Civil aircraft flight manual, marking, and placard requirements

The UAS, given its size and configuration has no ability or place to carry such a flight manual on the aircraft, not only because there is no pilot on board, but because there is no room or capacity to carry such an item on the aircraft. The equivalent level of safety will be maintained by keeping the flight manual at the ground control point where the pilot flying the UAS will have immediate access to it. The FAA has issued the following exemptions to this regulation: Exemption Nos. 11660, 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10167A, 10602, 32827, and 10700.



14 C.F.R. 91.103: Preflight Action

This regulation requires each pilot in command take certain actions before flight to ensure the safety of flight. An exemption is needed from this requirement as the pilot will take separate preflight actions, including checking for weather conditions, checking flight battery requirements, checking takeoff and landing distances, and all other actions in the Preflight Checklist in this document and the DJI Manual. These actions will provide an equivalent level of safety.

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. By design, UAS and remotely piloted aircraft do not have fully functional dual controls. Flight control is accomplished through the use of a control box that communicates with the aircraft via radio communications. The FAA has previously approved exemptions for aircraft without fully functional dual controls. 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, the ability to control the UAS via radio signals from the controller, and by the size and speed of the aircraft.

14 C.F. R. 91.119: Minimum Safe Altitudes

Section 91.119 establishes safe altitudes for operation of civil aircraft. Section 91.119 (d) allows helicopters to be operated at less than the minimums prescribed, provided the person operating the helicopter complies with any route or altitudes prescribed for helicopters by the FAA. This exemption is for a multi rotor craft that flies similarly to a helicopter, with vertical take off and vertical landing, which will typically operate at altitudes of 200 AGL, so an exemption may be needed to allow such operations. The UAS will never operate at altitude higher than 200 AGL and will be in a restricted area with security perimeter, where buildings and people will not be exposed to operations without their pre-obtained consent. The equivalent level of safety will be achieved given the size, weight, speed of the UAS as well as the location where it is operated. No flight will be taken without the permission of the property owner or local officials. Because of the advance notice to the property owner and any onsite personnel as outlined in the Manual, all affected individuals will be aware of the planned flight operations. Compared to flight operations with aircraft or rotorcraft weighting far more than the maximum 10 lbs. proposed herein and carrying flammable fuel, any risk associated with our operations is far less than those presently presented with helicopters and other conventional aircraft operating at or below 500 AGL in the construction industry. In addition, the low-altitude operations of the UAS 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 UAS may not have a barometric altimeter, but instead 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 Safety Check list, confirming the altitude of the launch site shown on the GPS altitude indicator before flight.

14 CFR 91.151 (a): Fuel requirements for flight in VFR conditions

Section 91.151 (a) outlines fuel requirements for beginning a flight in VFR conditions. Our UAS is limited to operations in sterile and controlled environments as outlined in the Manual, and has a limited range and flight time which require an exemption from 14 CFR 91.151(a). The battery powering the UAS provides approximately 25 minutes of powered flight. To meet the 30 minute reserve requirement in 14 CFR §91.151, UAS flights would be limited to 0 minutes in length. Given the limitations on the UAS's proposed flight area and the location of its proposed operations within a predetermined area, a longer time frame for flight in daylight or night VFR conditions is reasonable. TopGan Drones LLC believes that an exemption from 14 CFR §91.151(a) falls within the scope of prior exemptions. See Exemption 10673 (allowing Lockheed Martin Corporation to operate without compliance with FAR 91.151(a)). Operating the small UAS, in a tightly controlled area where only people and property owners or official representatives who have signed waivers will be allowed, with less than 30 minutes of reserve fuel, does not engender the type of risks that Section 91.151(a) was intended to alleviate given the size and speed of the small UAS. Additionally, limiting UAS flights to 10 minutes would greatly reduce the utility for which the exemption will be granted. An equivalent level of safety can be achieved by limiting flights to 25 minutes, or enough battery reserve to ensure that the UAS lands at the ground station with at least 20% of battery power (as determined by the onboard monitoring system and the pilot), whichever happens first. This restriction would be more than adequate to return the UAS to its planned landing zone from anywhere in its limited operating area. Similar exemptions have been granted to other operations, including Exemptions 11660, 2689F, 5745, 10673, and 10808.



14 CFR 91.203 (a) & (b): Carrying civil aircraft certification and registration

The regulation provides in part: (a) Except as provided in § 91.715, no person may operate a civil aircraft unless it has within it the following: (1) An appropriate and current airworthiness certificate.... (b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under §91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew. The UAS fully loaded weighs no more than 10 lbs and is operated without an onboard pilot. Therefore there is no ability or place to carry certification and registration documents or to display them on the UAS. An equivalent level of safety will be achieved by keeping these documents at the ground flight control point where the pilot flying the UAS will have immediate access to them, to the extent they are applicable to the UAS. 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 CFR 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 section and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply to TopGan Drones LLC. Maintenance will be accomplished by the operator pursuant to the flight manual and operating handbook as referenced in this Document and the DJI Manual. An equivalent level of safety will be achieved because these small UASs are very limited in size and will carry a small payload and operate only in restricted areas for limited periods of time. If mechanical issues arise the UAS can land immediately and will be operating from no higher than 200 feet AGL. As provided in the DJI Manual and this document , the operator will ensure that the UAS is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance performed. Moreover, the operator is the person most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety.



Pursuant to 14 C.F.R. Part 11, the following summary is provided for publication in the Federal Register, should it be determined that publication is needed:

Applicant TopGan Drones LLC seeks an exemption from the following rules: 14 C.F.R. §21, subpart H; 14 C.F.R 45.23(b); 14 C.F.R. § § 61.113(a) & (b); 91.7 (a); 91.9 (b) (2); 91.103(b); 91.109; 91.119; 91.121; 91.151(a); 91.203(a) and (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); 91.409 (a) (2) and 91.417 (a) & (b) to operate commercially a small unmanned vehicle (551bs or less) in order to: 1) monitor precision agriculture and/or irrigation operations; 2) maintain aerial assay of the operations and physical integrity of commercial drilling and/or excavating devices ; 3) maintain aerial imaging and/or monitoring of devices and/or materials integral to oil and gas pipeline operations; 4) maintain aerial imaging and/or monitoring by which power line and cable inspection(s) may be expedited; 5) maintain aerial imaging by which solar panel inspection(s) might be expedited; 6) maintain aerial operations by which wind turbine operations may be expeditiously inspected; and 7) facilitate aerial mapping and/or graphic imaging by which navigational or other devices may maintain and/or adjust course. Approval of exemptions allowing commercial operations of UASs in the construction industry enhances safety while reducing risk. Manned aircraft monitoring and surveying creates a greater risk because the craft are much larger, have combustible fuel, and carry an onboard human pilot. In contrast, a UAS weighing fewer than 10 lbs. and powered by batteries eliminates virtually all of that risk given the reduced mass and lack of combustible fuel carried on board. The UAS will carry no passengers or crew and, therefore, will not expose them to the risks associated with manned aircraft flights. The operation of small UASs, weighing less than 20 lbs., conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial operations. These lightweight aircraft operate at slow speeds, close to the ground, and in a controlled environment and, as a result, are far safer than conventional operations conducted with turbine helicopters operating in close proximity to the ground and people and/or other aerial vehicles which presently perform, or are performing, functions for which exemptions are sought hereof.