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

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

August 19, 2015

Exemption No. 12533
Regulatory Docket No. FAA–2015-2184

Mr. Anthony W. De La Pena
Peace of Thorn Productions, LLC
4237 Arlington Drive
Richton Park, IL 60471

Dear Mr. De La Pena:

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 20, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Peace of Thorn Productions, LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial inspection, photography, scripted closed set filming and videography for the motion picture, television, and utility company 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 and DJI S800 EVO.

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] and closed set motion picture and filming. 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, Peace of Thorn Productions, 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 the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection and closed set motion picture and filming. 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, Peace of Thorn Productions, 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 and DJI S800 EVO 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 permitted.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Enclosures

Peace of Thorn Productions LLC.

Anthony W. De La Pena
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Richton Park, IL. 60471
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EIN: 46 - 0740606; Illinois LLC. No. 04037715
Illinois Business Authorization # 4095 – 0867

May 20, 2015

U.S. Department of Transportation
Docket Management System
1200 New Jersey Ave. S.E.
Washington, D.C. 20590.

RE: Request for Exemption under Section 333 of the FAA Reform and Modernization Act of 2012 and Part 11 and Part 21 of the Federal Aviation Regulations from: 14 C.F.R. 21(h); 14 C.F.R. 43.7; 14 C.F.R. 43.11; 14 C.F.R. 45.11; 14 C.F.R. 45.21; 14 C.F.R. 45.23; 14 C.F.R. 45.23(b); 14 C.F.R. 45.25; 14 C.F.R. 45.27; 14 C.F.R. 45.29; 14 C.F.R. 47.3(b)(2); 14 C.F.R. 47.31(c); 14 C.F.R. 61.113; 14 C.F.R. 61.113(a) and (b); 14 C.F.R. 91.7(a); 14 C.F.R. 91.9(b)(2); 14 C.F.R. 91.9(c); 14 C.F.R. 91.103(b)(2); 14 C.F.R 91.105; 14 C.F.R. 91.109; 14 C.F.R. 91.113(b); 14 C.F.R. 91.115; 14 C.F.R. 91.119; 14 C.F.R. 91.119(b)(c); 14 C.F.R. 19.121; 14 C.F.R. 91.151; 14 C.F.R. 91.151(a); 14 C.F.R. 91.203(a) and (b); 14 C.F.R. 91.215; 14 C.F.R. 91.403; 14 C.F.R. 91.405; 14 C.F.R. 19.405(a) and (b); 14 C.F.R. 91.407; 14 C.F.R. 91.407(a)(1); 14 C.F.R. 91.409; 14 C.F.R. 91.409(a)(2) and 14 C.F.R 91.417; 14 C.F.R. 91.417(a) and (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 and Part 21, I Anthony W. De La Pena: President/CEO/CFO/Owner of Peace of Thorn Productions LLC an Entertainment Film and Video Production Corporation an operator of Small Unmanned Aircraft Systems or (sUAS) equipped to conduct aerial inspection, photography, scripted closed set filming and videography for the motion picture, television, and utility company industries,

hereby petitions for an Exemption from the listed Federal Aviation Regulation or (FARs) to permit commercial operation of its sUARs, 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. The intended utilization of the sUAS operations contemplated by this petition is in the public interest because it clearly satisfies the Four D's of exemplary uses of UAS: to replace work that is Dangerous, Difficult, Dull, or Dirty, while simultaneously providing an equivalent or greater level of safety than approved manned aircraft operations.

For your ease in reviewing this petition, please refer to the table of contents which begins on the next page. If I can provide any additional information to assist your understanding or review of this document, please do not hesitate to contact me at 708-513-5431 / 708-748-5856 or via email at delapenaa31@yahoo.com.

I thank you very much for all that you do for the citizens, professionals, and businesses of the United States. Equally important, I thank you for taking the time away from you busy work schedule to review and streamline my petition towards a positive outcome. I look forward to your reply.

Sincerely

Mr. Anthony W. De La Pena

Table of Contents

Exhibit List

I. Publishable Summary

Pursuant to 14 C.F.R. Part 11 and Part 21, the following summary is provided for publication in the Federal Register, should it be determined that publication is needed:

Applicant seeks an Exemption from the following Rules:

14 C.F.R. 21(h); 14 C.F.R. 43.7; 14 C.F.R. 43.11; 14 C.F.R. 45.11; 14 C.F.R. 45.21; 14 C.F.R. 45.23; 14 C.F.R. 45.23(b); 14 C.F.R. 45.25; 14 C.F.R. 45.27; 14 C.F.R. 45.29; 14 C.F.R. 47.3(b)(2); 14 C.F.R. 47.31(c); 14 C.F.R. 61.113; 14 C.F.R. 61.113(a) and (b); 14 C.F.R. 91.7(a); 14 C.F.R. 91.9(b)(2); 14 C.F.R. 91.9(c); 14 C.F.R. 91.103(b)(2); 14 C.F.R 91.105; 14 C.F.R. 91.109; 14 C.F.R. 91.113(b); 14 C.F.R. 91.115; 14 C.F.R. 91.119; 14 C.F.R. 91.119(b)(c); 14 C.F.R. 19.121; 14 C.F.R. 91.151; 14 C.F.R. 91.151(a); 14 C.F.R. 91.203(a) and (b); 14 C.F.R. 91.215; 14 C.F.R. 91.403; 14 C.F.R. 91.405; 14 C.F.R. 19.405(a) and (b); 14 C.F.R. 91.407; 14 C.F.R. 91.407(a)(1); 14 C.F.R. 91.409; 14 C.F.R. 91.409(a)(2) and 14 C.F.R 91.417; 14 C.F.R. 91.417(a) and (b) to operate commercially a small unmanned aircraft system (sUAS) (15lbs or less).

Approval of exemption for Peace of Thorn Productions will allow commercial operations of sUASs in the open film and video motion picture, photography, and utility company inspection industries, enhancing safety by removing the risk of physical harm to personnel on and off scripted closed-set environments, and maintenance technicians and professionals of utility companies, otherwise exposed to dangerous camera angle techniques and equipment to achieve the aerial affect, and high towers and electric wires and equipment currently used to investigate damaged, and worn out material. In reference to filming and videography current operations require a helicopter involving two to four or five persons flying at very low altitude trying to achieve an aerial visual effect for a scripted scene which is extremely dangerous for all involved including surrounding structures and high power electrical lines with the risk of property damage or worst death. In addition, motor vehicles with mounted film cranes which extent 25 to 30 feet over and past the motor vehicle's center of gravity requirements to achieve an aerial visual scripted scene effect are currently used which is also very dangerous for all involved because of the high risk of the motor vehicle crashing into people, other motor vehicles, and buildings causing property damage, human injury or death. In reference to utility company inspections current operations involve having a crew of 4 or 5 technicians with two or three persons spending hours prepping, mounting and then climbing electrical towers to inspect for damage and worn out material at each tower location under dangerous conditions, and with the risk of life threatening scenarios.

Moreover, another current practice of utility company inspection operations involve the use of a helicopter with 3 or 4 persons flying at very low altitude trying to achieve an aerial visualization of damaged and worn out tower structure and electrical wiring material which is extremely dangerous for all involved including surrounding structures and high power electrical lines with the risk of property damage, human injury or worst death. In contrast, a sUAS weighing less than 15lbs. and is powered by batteries eliminates virtually all of the risk for property damage, human injury, or death.

The operation of small UASs, weighing less than 15lbs., conducted in the strict conditions outlined below 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 ground, and in a low risk, low to moderate population environment and, as a result, are far safer than conventional operations conducted with helicopters, moving vehicles, or fixed-wing aircraft operating in close proximity to the ground, buildings, people, and other elevated standing structures. The intended utilization of the sUAS operations contemplated by this petition is in the public interest because it clearly satisfies the Four D's of exemplary uses of UAS: : to replace work by humans that is Dangerous, Difficult, Dull, or Dirty, while simultaneously providing an equivalent or greater level of safety.

Finally, the petitioner requests Exemption from the requirement of the PIC possessing a private or commercial pilot's license. Research studies cited by petitioner, sponsored by the FAA and Army Research Laboratory, demonstrate that UAS, even those much larger than the sUASs proposed by Peace of Thorn Productions LLC., can be safely flown by non-certificated pilots with a small amount of training. However, in the alternative, petitioner requests that if the agency concludes the PIC qualifications proposed in the Exemption request do not meet the interim standards it is implementing; it should not deny the application on that ground. Rather, it should grant the Exemption subject to Peace of Thorn Productions LLC meeting whatever interim PIC qualifications the agency has adopted in Section 333 Exemption proceedings, for example, the PIC qualification policies established in any of the pending Exemption petitions of ComEd Energy, Sprint, AT&T, Warner Bros., Paramount Pictures, Fox Television, or any other utility, film and videography industry not listed here.

II. Petitioner's Contact Information

Peace of Thorn Productions LLC.
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Email: delapenaa31@yahoo.com
EIN: 46 - 0740606; Illinois LLC. No. 04037715
Illinois Business Authorization # 4095 – 0867

III. Peace of Thorn Productions LLC's Operations

A. The sUASs

The requested Exemption will permit the operation of small, unmanned multi-rotor aircraft based on the DJI Phantom II and DJI S800, weighing less than Fifteen (15) pounds (inclusive of batteries and technical payload). These rotorcrafts operate at speeds of no more than thirty (30) knots, and have the capability to hover and move in the vertical and horizontal planes simultaneously.

The sUASs will have the following specifications or equivalent:

Airframe:	DJI Phantom II Dual Frame; DJI S800 EVO
Control System(s):	2.4 GHz ISM; Intelligent Orientation Control (IOC); A2
Tx:	5.8G SWR<1.5; Futaba 14 SG
Rx:	5.8G SWR<1.5; Internal in A2
Motors:	Tiger (MN2214-KV920 Anti-Gravity Series); DJI 4114
Propellers:	Tiger RC 9" (9443) Carbon Fiber; Tiger RC 15" Carbon Fiber
Data Link(s):	DJI 2.4GHz Data Link LK24-BT; DJI Data Link 2.4GHz Data Link
	OSD: iOSD Mark II/iOSD Mini; iOSD Mark II
Gimbal:	Zenmuse H3-2D; Zenmuse
Camera:	GoPro Hero 3+ Black Edition; Canon EOS 70D
Batteries:	11.1 V, 5200 mAh 3 S lithium-polymer (LiPo); Glacier from RC Buddy
	6000mA 6-cell with EC5 main power connection

Please refer to Exhibits 4 through 10 attached to this petition for further information about the Phantom II, and the 2.4 GHz ISM; Intelligent Orientation Control (IOC) control system; the S800 EVO, and the A2 Control System.

B. Flight Conditions

The sUASs will be flown in airspace between and less than 400 feet above ground level (AGL) and under controlled conditions on restricted, populated, rural, and private property. The sUASs will be used for aerial inspection, photography, scripted closed set filming and videography for the motion picture, television, and utility company industries.

1. Scripted Closed-Set Filming and Videography

Peace of Thorn Productions LLC proposes Exemption under Section 333 to operate commercially in private, secured-entry scripted closed-set filming and videography operations, including but not limited to, the City of Chicago, the Greater Chicago Metropolitan region, and including Northwestern Indiana's Lake and Porter Counties. These areas are abundant with aerial scenic, photographic, and cinematographic opportunities with many areas providing secured time limited access which greatly reduces hazardous conditions for the public. These areas are over 10 miles away from any major or minimal municipality airport.

Peace of Thorn Productions LLC intends to expand its operation in other parts, similarly to abundant scenic, photographic, and cinematographic areas in the United States, if permitted. Any scripted closed-set filming and videography operations will be guarded and restricted to locations in Class G airspace and at least 10 miles from any controlled and uncontrolled runways, to protect the public from hazardous conditions.

2. Aerial Photography

Peace of Thorn Productions LLC proposes Exemption under Section 333 to operate commercially in private and semi-public, secured-photography operations, including but not limited to, the City of Chicago, the Greater Chicago Metropolitan region, and including Northwestern Indiana's Lake and Porter Counties. These areas are abundant with aerial scenic, photographic, and cinematographic opportunities with many areas providing secured time limited access which greatly reduces hazardous conditions for the public. These areas are over 10 miles away from any major or minimal municipality airport.

Peace of Thorn Productions LLC intends to expand its operations in other parts, similarly to abundant scenic, photographic, and cinematographic areas in the United States, if permitted. Any aerial photography operations will be guarded and restricted to locations in Class G airspace and at least 10 miles from any controlled and uncontrolled runways, to protect the public from hazardous conditions.

3. Aerial Utility Inspection

Peace of Thorn Productions LLC proposes Exemption under Section 333 to operate commercially in private, secured-entry aerial utility company and community municipality site inspection operations, including but not limited to, the City of Chicago, the Greater Chicago Metropolitan region, and including Northwestern Indiana's Lake and Porter Counties. These areas are abundant with power lines, communication towers and antennas, and municipality water towers with many areas fenced off and have manned and secured gates and personal which restrict public access, providing and offering secured time limited access which greatly reduces hazardous conditions for the public. These areas are over 10 miles away from any major or minimal municipality airport.

Peace of Thorn Productions LLC intends to expand its operation in other parts, similarly to abundant power lines, communication towers and antennas, and municipality water tower areas in the United States, if permitted. Any aerial utility company inspection operations will be guarded and restricted to locations in Class G airspace and at least 10 miles from any controlled and uncontrolled runways, to protect the public from hazardous conditions.

C. Flight Operations

The purpose of every sUAS flight will be to safely, accurately, and efficiently create aerial scenic, photographic, cinematographic, and utility company material inspection imaging. The sUAS will film, video tape, and collect photographs, inspect equipment to determine maintenance and repairs, and use specialized film, video, and photography software to process, prepare, and display the results. The final imaging output will be HD high resolution aerial imaging.

Every sUAS flight will use at minimum a one man flight crew, however, an assistant/spotter will be available for filming and videotaping, and a utility company technician/expert will be present for utility company inspections, and will possess the appropriate credentials and licenses. The Pilot in Command (PIC) will have substantial prior experience with operating the sUASs.

The standard pre-flight and operational procedure will be as follows:

1. Meet with security and complete pre-flight checklist and inspection appropriate to each site (described below).
2. Drive to area to be filmed, videotaped, photographed, and inspected.
3. The Pilot in Command begins to ready sUASs for flight.
    a. Set up hand held weather station on tripod.

b. Check over airframe, connections, and propellers for any damage during transport in vehicle. While the airframe has the ability to disassemble easily for transport, the sUASs will remain fully assembled. The sUASs is transported in the back of a SUV which has straps installed to secure the sUAS in place to minimize electrical connection fatigue, and a customized waterproofed case is also used to transport the sUASs.
c. Install and calibrate camera in gimbal.
d. Turn on and ready lap top in SUV.
e. Connect communication antennae to laptop.
f. Open Ground Station software and pull up pre-planned aerial flight path.
g. Boot up secondary GPS for tracking and aerial imaging.
h. Attach secondary GPS to sUAS.
i. Remove main flight *Tx from case and power up, verify voltage and settings.
j. Remove gimbal Tx from case and power up, verify voltage and settings.
k. Remove dual battery pack for flight, measure current voltage, log in battery manual.
l. Strap or insert batteries securely on and in aUAS, do not attach main power.
m. Move sUAS to take off point, approximately 30 feet from vehicle(s) and crew.
n. Attach main power.
o. Listen to power up sequence of beeps for ESC and motors.
p. Using Flight Tx cycle through different control modes observing LED lights for good connection and response.
q. Using Gimbal Tx cycle through all controls making sure the gimbal and camera respond to commands.
r. Remove secondary GPS and hold in front of camera taking picture or video to record a time stamp image.
s. Reattach secondary GPS.
t. Set up traffic cones around sUAS with approximately a 20 foot radius. This is the "home" area and the operations are not allowed inside this area while the electrical motor(s) are running.
u. Walk back to transport vehicle with both Tx.
v. Using Flight Tx activate engine power without moving throttle up. This checks that the automatic throttle kill is working and also records the "home" point.
w. Using laptop Ground Station now select button connecting laptop to sUAS.
x. sUAS should appear on the screen, along with a recorded home point, battery voltage, current altitude relative to the ground, and current velocity.

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* "Tx" represents radio transmitter for command and control. "Rx" represents radio receiver for command and control.

y. Upload flight path data to sUAS.
z. Verify good upload and connection
aa. Verify weather from portable weather station, and weather app.
bb. Record time and weather in flight log.
cc. sUAS is now fully prep and ready to go.
dd. Wait for secondary crew member to return from setting out GCP's.

4. While Pilot in Command is readying the aircraft the second crew member is preparing the Ground Control Points (GPC's) and walking the site.
    a. Power up and calibrates the survey grade GPS equipment.
    b. Begin setting GCP's and shooting center of targets with survey GPS.
    c. While setting out GCP's secondary crew is also making sure area is clear of all people.
5. Typically secondary crew and pilot 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 lap top and camera Tx.
6. Pilot double checks take-off area is clear.
7. Pilot takes off flying to the approximate survey altitude.
8. Pilot instructs secondary crew member to initiate preprogrammed flight path.
9. Secondary Crew verifies that the Ground Station has good connection and is tracking the sUAS.
10. Secondary crew then turns on the camera to take pictures at a continuous interval.
11. During entire preprogrammed flight Pilot always has visual line of sight and is prepared to take over flight operations. Pilot'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.
12. During flight secondary crew 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 pilot.
13. As the mission completes the Pilot informs the secondary crew he is taking back over control.
14. Secondary crew turns off the camera.
15. Pilot begins to land the sUAS.
16. After safely touching down the Pilot immediately goes and unplugs the main power. He then checks the pictures to verify if the film, video, and pictures are good and the mission was successful.
17. If successful secondary crew leaves to go pick up GCPs.
18. Pilot checks battery voltage and records in battery log.
19. Pilot records flight time in Flight Log.

20. Pilot turns off both Tx, secondary GPS, and camera.
21. Pilot looks over airframe to see if any damage or loose connections happened from the flight.
22. Pilot begins to pack all equipment back up for safe transport.

The flight crew will follow separate safety procedures for filming, videotaping, photography, and utility company, and community municipality inspection.

At the filming, videotaping, and photography sites, the flight crew will check in at the designated scripted closed-set area, and chosen photographic site, and go through a safety inspection. The crew will meet with representative(s) who serve as a liaison in directing any personnel associated with the surrounding chosen scripted closed-set area, and will have any unnecessary personnel, vehicles, or any other unidentified items not described within the script cleared off before the crew begins its filming, or videotaping. After the flight, the representative(s) will inform any unnecessary personnel, owner of vehicles that they can begin returning to the area again. (See Exhibits 2 and 3)

At the utility company and community municipality sites, the flight crew will wait for utility company personnel and security, and put on personal protection equipment, which includes hard hats, safety glasses, flame resistant coveralls, and steel toed boots. The crew then drives around the electrical tower site(s), communication tower(s), and water tower(s) sites to inspect the flight area, set out ground control points, and take land based photographs, and parks just outside of the entrance(s). (See Exhibit 1)

IV. Privacy

There is little concern that the proposed flights will cause invasions of privacy because all flights will occur over controlled access property with the property owner's prior consent and knowledge. In addition, as the over flight areas will be under controlled designated scripted closed-set area(s), chosen photographic site(s), and fenced off secured utility company rural to semi-rural sites, there is little to no chance that there will be inhabited houses in the visual area or other people who have not consented to being filmed, videotaped, or photographed or otherwise agreed to be in the area where filming, videotaping, or photographing will take place. No attempt will be made to identify any individuals filmed, videotaped, or photographed 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.

V. Aircraft and Equivalent Level of Safety

Peace of Thorn Productions LLC proposes that the exemption requested herein apply to civil aircraft that have the characteristics and that operate with the limitations listed herein. These limitations provide for at least an equivalent or higher level of safety to operations under the current regulatory structure.

These limitations and conditions to which Peace of Thorn Productions LLC agrees to be bound when conducting commercial operations under an FAA issued exemption include:

1. The sUAS will weigh less than 15 lbs.
2. Flights will be operated within line of sight of a pilot and observer.
3. Maximum total flight time for each operational flight will be 3 hours. Flights will be terminated at 20% battery power reserve should that occur prior to the 3 hour limit.
4. Flights will be operated at an altitude of no more than 400 feet AGL. Despite this limitation, the majority of flights are anticipated to operate at no more than 270 feet AGL.
5. Minimum crew for each operation will consist of the sUAS pilot and the visual observer.
6. A briefing will be conducted in regard(s) 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 operator will submit a written Plan of Activities to the FSDO at least one day before the proposed operations begin.
9. Pilot and observer will have been trained in operation of sUAS generally and received up to-date information on the particular sUAS to be operated.
10. Pilot and observer will at all times be able to communicate by voice and/or text.
11. Written and/or oral permission from the relevant property holders will be obtained.
12. 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.

13. The sUAS will have the capability to abort a flight in case of unexpected obstacles or emergencies.
14. If the multi-rotor and its controller disconnects during flight, the system's failsafe protection will come to the rescue and the multi-rotor will return to home and land automatically, rather than flying off uncontrollably or landing at an unknown location.

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 film, video, photography, and utility company inspection industries pursuant to Peace of Thorn Production LLC's rules of operation appended hereto.

VI. Public Interest and Safety

Use of the sUAS will increase and enhance ground safety by eliminating the risk of physical harm to personnel on and off scripted closed-set environments, and maintenance technicians and professionals of utility companies, otherwise exposed to dangerous camera angle techniques and equipment to achieve the aerial affect, and high towers and electric wires and equipment currently used to investigate damaged, and worn out utility company material(s). Currently, utility company's use climbers with harness and rope to scale electric towers to inspect and maintain their equipment, other utility companies utilize trucks with lift buckets that only extend 25 to 30 feet above ground to accomplish repairs and maintenance, and then the technicians must clime and scale the rest of the tower(s) to repair and maintain material(s). In reference to filming and videoing scripted closed-set environments, the current practice to achieve aerial scenic photographic and cinematographic opportunities are by using trucks with mounted camera extension equipment that reaches 20 to 25 feet past the center of gravity of the vehicle which can lead to overturning the vehicle. Also, helicopters are used to achieve aerial scenic photographic and cinematographic opportunities which can cause air crashes because they need to fly at low altitudes which can harm people, property, and cause death.

By flying the sUASs over scripted closed-set environments and utility company's high towers and electric wires, rather than putting pilots in helicopters flying at low altitude and people in a vehicle with a mounted camera extension, or having utility company climbers scale electrical towers to inspection equipment and material, the hazards stemming from these extreme conditions will be removed.

Additionally, a sUAS can complete all these tasks in less than 20 to 30 minutes, a drastic reduction in the time it takes the workers, who may otherwise spend three or more hours at a time in these conditions. Scenic aerial photographic and cinematographic scripted closed-set environments and utility company's high towers and electric wire inspections made possible by the sUASs will reveal dangerous conditions, including possible being electrocuted, crashing vehicles into people and buildings, causing great harm, injury, or death to all involved in the process.

VII. Regulations from Which Exemption is Requested

A. 14 C.F.R. 21(h): Airworthiness Certificates

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 21(h). 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, and use in controlled environments on private land, as described previously in this petition.

B. 14 C.F.R. 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.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 43.7. This part provides, inter alia, 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. The nature of the sUAS is that of a model aircraft and the operator(s) of Peace of Thorn Productions LLC who will maintain and when necessary will seek certified and licensed repair personnel. The operator(s) will conduct inspections and maintenance based on maintenance guidelines provided by the manufacturer of the sUASs, DJI. (See Exhibits 4-10). The capabilities of these operator(s) to maintain and repair the sUAS will meet the requirements for an equivalent level of safety pursuant to Section 333 for the type of sUASs, its intended use, and the operating environment.

C. 14 C.F.R. 43.11: Content, form, and disposition of records for inspections conducted under parts 91 and 125 and §§135.411(a)(1) and 135.419 of this chapter.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 43.11. This part provides, inter alia, that maintenance record entries be maintained and for the listing of discrepancies and placards by inspectors.

The sUAS, due to its small size, does not have room for placards to be placed in or on it and no inspections for sUAS have been certified by FAA at the present time. However, as a condition to the approval of exemption, Peace of Thorn Productions LLC is willing to keep log books of all maintenance and repairs.

D. 14 C.F.R. 45.11: Marking of products.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 45.11. This part provides, inter alia, that the manufacturers of aircraft, engines, propellers, mark such aircraft, engines, or propellers with an approved fireproof identification plate. The sUAS, due to its small size, does not have room for fireproof placards to be placed in it. Any required placards could become hazardous, due to the additional weight and strain placed on the sUAS.

E. 14 C.F.R. 45.21: General.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 45.21. This part provides, inter alia, that except as provided in §45.22, 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. There are no current procedures for obtaining a registration mark for sUASs by the FAA. However, as a condition to the approval of exemption, Peace of Thorn Productions LLC is willing to be assigned a registration number and to display it where practicable as addressed in this petition relative to Parts 23, 27, and 29, below.

F. 14 C.F.R. 45.23: Display of marks; general.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 45.11. This part provides, inter alia, that each operator of an aircraft must display on that aircraft marks consisting of the Roman capital letter “N” (denoting United States registration) followed by the registration number of the aircraft. Moreover, 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.

The sUAS, due to its small size, does not have room to display aircraft marks in a conventional size. However, as a condition to the approval of exemption, Peace of Thorn Productions LLC is willing to affix an aircraft mark to one or more of the "arms" 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.

The word “Experimental” will be placed on the fuselage in compliance with §45.29(f). However, a partial exemption from this display regulation 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 sUAS, two-inch lettering will be impossible.

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 UAS as “Experimental.” The requested exemption is consistent with the following exemptions to this regulation that the FAA has issued: Exemptions Nos. 10700, 8738, 10167 and 10167A.

G. 14 C.F.R. 45.25: Location of marks on fixed-wing aircraft

The sUAS is a multirotor model aircraft and is not fixed-wing. Therefore, 14 C.F.R. 45.25 is inapplicable.

H. 14 C.F.R. 45.27: Location of marks; nonfixed-wing aircraft

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 45.27. This part provides, inter alia, 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. The sUAS, due to its small size, does not have a cabin, fuselage, boom or tail to display the marks required by §45.23.

I. 14 C.F.R. 45.29: Size of marks

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 45.27. This part provides, inter alia, at subpart (3) that the registration marks for rotorcraft must be at least 12 inches high. The sUAS, due to its small size, does not have any surface area large enough to display marks anywhere near 12 inches high. However, as a condition to the approval of exemption, Peace of Thorn Productions LLC is willing to affix an aircraft mark to one or more of the "arms" 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.

J. 14 C.F.R. 47.3(b)(2): Registration required

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 47.3(b)(2). This part provides "(b) No person may operate an aircraft that is eligible for registration under 49 U.S.C.

44101-44104, unless the aircraft—(1) Has been registered by its owner; [or] (2) Is carrying aboard the temporary authorization required by §47.31(c)."

There are no current procedures for obtaining a registration mark for sUASs by the FAA. However, as a condition to the approval of exemption, Peace of Thorn Productions LLC is willing to be assigned a registration number provided by FAA and to display it where practicable as addressed in this petition relative to Parts 23, 27, and 29, above.

K. 14 C.F.R. 47.31(c): Application

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R.47.31 (c). This part provides "(c) After compliance with paragraph (a) of this section, the applicant for registration of an aircraft last previously registered in the United States must carry the second copy of the Aircraft Registration Application in the aircraft as temporary authority to operate without registration."

Because FAA currently has no process for registering sUAS, it is impossible to comply with Part 47.31(a), which states, inter alia: "(a) Each applicant for a Certificate of Aircraft Registration, AC Form 8050-3 must submit the following to the Registry: (1) An Aircraft Registration Application, AC Form 8050-1, signed by the applicant in the manner prescribed by §47.13; (2) The original Aircraft Bill of Sale, AC Form 8050-2, or other evidence of ownership authorized by §47.33, §47.35, or §47.37 (unless already recorded at the Registry)."

L. 14 C.F.R. § 61.113: Private Pilot Privileges and Limitations: Pilot in Command.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 61.113. The PIC (pilot in command) of the sUAS does not possess either a private or commercial license. However, because (i) the sUAS is essentially 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 a private or commercial pilot's license.

The level of safety provided by Peace of Thorn Productions LLC meets or exceeds that provided by an individual possessing a private or commercial pilot's license operating a manned aircraft. For conducting safe sUAS operations it is more important for 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. Peace of Thorn Productions LLC will have an operator (PIC) who has 1.5 years of radio control aircraft experience and has flown nearly 150 flights on these particular sUASs, and therefore meets or exceeds the present level of safety envisioned under this Section.

Stated another way, 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. Both FAA and Army Research Laboratory research demonstrate that UAS, even those much larger than the sUAS proposed by Peace of Thorn Productions LLC, can be safely flown by non-certificated pilots with a small amount of training.

As one Army Research Laboratory study stated:

> **"[T]he specific motor skills needed to control the radio-controlled UAV would have to be learned by aviators independently of the motor skills learned in flying an aircraft. In particular, the somatic and visual cues that pilots use during aircraft landings would not be useful (and perhaps even counterproductive) for the different skill sets and perceptual viewpoint necessary for radio-controlled landings."** 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 ARLTR-2081, Aberdeen Proving Ground, MD: Army Research Laboratory, page 12 (2000). (See Exhibit 11)

In addition to the above research by the Army Research Laboratory, additional research reports lend further support for the exclusion requested, including one sponsored by the FAA and the other sponsored by the Institute of Aviation, Aviation Human Factors Division, at the University of Illinois at Urbana-Champaign:

1. 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.

> **"We know that certain systems, like the U.S. Army Hunter and Shadow systems, are successfully flown by pilots with no manned aircraft experience."**2 (See Exhibit 12).

2. 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*.

> **"Using the Army's Job Assessment Software System (JASS), Barnes, et al (2000) elicited Hunter UAV operators ratings of the relative importance of various cognitive skills in UAV air vehicle operators. Ratings indicated that outside of communication skills, raters did not consider flight-related skills of great importance to UAV operations, leading the authors to conclude that selection of rated aviators as air vehicle operators would be of little value."** (See Exhibit 13).

Finally, if the agency concludes that the PIC qualifications proposed in this exemption request do not meet the interim standards it is implementing, it should not deny the application on that ground. Rather, it should grant the exemption subject to Peace of Thorn Productions LLC meeting whatever interim PIC qualifications the agency has adopted in other Section 333 exemption proceedings. For example, the pending exemption petitions of NextEra Energy, Inc., San Diego Gas & Electric Company, Southern Company Services LLC., Utility Aerial Services Inc., MicroCopter Professional Services Inc., Montico, Inc., Aerius Flight LLC., Saratoga Aerial Photo and Video, Aerial Production Services Inc., NextEra Energy Inc., Oceaneering International, Inc., and Aeryon Labs, Inc., has already raised the PIC qualification issue. Applicant would be willing to adhere to the PIC qualification policies established in any of those proceedings.

M. 14 C.F.R. 61.113(a) and (b): Private Pilot Certificate and Act as Pilot in Command

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 61.113(a) and (b). Section 61.113(a) and (b) prescribes that (a) no person who holds a private pilot certificate may act as a pilot in command of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as pilot in command of an aircraft. (b) a private pilot may, for compensation or hire, act as pilot in command 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.

Sections 61.113 (a) & (b) limit private pilots to non-commercial operations**.**

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 Peace of Thorn Productions LLC meets or exceeds 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).

In addition, there are no standards for either Private or Commercial sUAS pilot certificates. The safe operation and control of the UAS as described in the Exemption Applications does not depend on the type of FAA license held by the PIC. Given the restricted and controlled airspace within which operations will take place, the key factors needed by the PIC are knowledge of the airspace within which the "closed set filming" operation will take place and how that airspace fits into the National Airspace System (NAS). That knowledge can be and is gained primarily through ground school and not through flight training in fixed wing or rotor aircraft, nor is it dependent on the acquisition of a commercial or private pilot's certificate. Those certificates demonstrate knowledge of the factors and skills needed for the safe operation of those types of aircraft (fixed wing or rotorcraft). It cannot be assumed that a commercial pilot, approved to operate a helicopter or fixed wing aircraft, has the skill or ability to safely operate a small unmanned aerial vehicle, operating at 400 AGL or lower, within strictly controlled pre-approved airspace. Besides knowledge of airspace regulations, dexterity in the control and operation of the sUAS acquired from actual operation of the aircraft is the most important factor in establishing an equivalent level of safety.

If the PIC has acquired the necessary knowledge of airspace requirements, the relevant issues are (1) where the aircraft will be flown, (2) the size of the aircraft relative to what is being used today to accomplish the same mission, and (3) what precautions will be taken to ensure the safety of those in the area of operation. As set forth in the Exemption Application, Applicants, to address those issues, have proposed that the PIC has at least an FAA Private Pilots Certificate and a Class III medical; the aircraft be operated within a secure environment; and that no one be allowed to enter the secure environment unless they are part of the production, have been fully briefed of the risks prior to operation of the sUAS, and have consented to the risks associated with being in the operating area.

Should there be a mishap, the sUAS being flown pose significantly less of a threat than the helicopters and fixed wing aircraft now being employed because they are a fraction of the size, carry no flammable fuel, do not carry crew or passengers, and pose an infinitesimal risk to others. This is in stark contrast to conventional aircraft that are flown to the site, carry explosive fuel, carry passengers and crew, and operate in a much larger area.

From a practical standpoint, there are relatively few licensed full-scale aircraft pilots who are also qualified to fly the type of sUAS that are utilized for motion picture industry image-capture operations. There are even fewer commercial pilots that can fly these sUAS – to the point that to do both is considered rare. Assuming that it is unlikely for a company to find a pilot that has both qualifications, that company would either have to source a qualified sUAS pilot to train and obtain a commercial certificate, or find a commercial certificated pilot who would be willing to learn to fly a sUAS to the competency level required for professional motion picture industry use*.

As set forth in the Operations Manual the minimum requirements for the PIC include:

1) Private Pilot's license and a Class III medical;
2) A minimum of 200 flight cycles and 25 hours of total time as a sUAS rotorcraft pilot and at least 10 hours logged as a sUAS pilot with a similar sUAS type (single blade or multirotor);
3) A minimum of 5 hours as sUAS pilot with the make and model of sUAS to be utilized for operations under the exemption and 3 take offs and landings in the preceding 90 days;
4) Have undergone a qualification process consisting of a knowledge test of the aircraft to be used and a flight demonstration to be administered by a FSDO-approved company pilot.

Requiring a sUAS pilot to obtain a commercial certificate, as opposed to just a private pilot certificate, creates a significant financial burden and provides little or no added benefit. For example, consider a company that has financed its employee's private pilot's license (PPL) and that the employee accrued 100 hours of flight time as part of his or her PPL training. To obtain a commercial certificate, he or she now needs an additional 150 hours to qualify for the commercial rating.

This additional training—assuming that an instrument rating is not needed because the proposed sUAS operations would be strictly VFR—would cost, at a minimum, approximately $21,000. The costs breakdown as follows:

140 flight hours in a basic fixed wing aircraft (i.e. C172) @ $125 per hour =	$17,500
10 flight hours in a complex fixed-wing aircraft @ $200 per hour =	$ 2,000
20 hours flight instructor (part 61) @ $75 per hour =	$ 1,500
Total Cost =	$21,000

However, the reality is that oftentimes the cost is much greater. Based upon this analysis, combined with all factors, including the lack of qualified commercial pilots; it is hard to envision a cost benefit to the requirement that commercial pilots must operate the sUAS.

N. 14 C.F.R. 91.7(a): Civil aircraft airworthiness.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.7(a). 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 standard will exist for determining airworthiness. Given the size and weight of the aircraft and the requirements contained in Peace of Thorn Productions LLC ‘s rules of operations, described above, for maintenance and use of safety check lists prior to each flight, an equivalent level of safety will be provided.

O. 14 C.F.R. 91.9(b)(2): Civil aircraft flight manual, marking, and placard requirements.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.9(b)(2). This part provides:

> "(b) 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."

First, there does not currently exist a method of approving manuals for sUAS. Second, given the size and configuration of the sUAS, there is no space to carry such a flight manual on the aircraft. In addition, carrying the manual on the aircraft would be pointless, since there is no pilot or other person on board who could read or use it.

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

P. 14 C.F.R. 91.9(c): Civil aircraft flight manual, marking, and placard requirements.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.9(c). This part provides: "(c) No person may operate a U.S.-registered civil aircraft unless that aircraft is identified in accordance with part 45 of this chapter."

As stated above, there is no current registration process for sUAS; and the sUAS, 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 exemption, Peace of Thorn Productions LLC is willing to affix an aircraft mark to one or more of the "arms" 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.

Q 14 C.F.R. 91.103: Flight preparation.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.103. Section 91.103 prescribes, in pertinent part, that each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight, to include:

(a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC;

(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.

This regulation requires each pilot in command to take certain actions before flight to insure the safety of flight. As FAA approved rotorcraft flight manuals will not be provided for the aircraft an exemption will be needed. An equivalent level of safety will be provided by Peace of Thorn Productions LLC ‘s rules of operations, described above, for maintenance and use of safety check lists prior to each flight, which will allow for an equivalent level of public safety. The PIC will take all actions including reviewing weather, flight battery requirements, landing and takeoff distances and aircraft performance data before initiation of flight.

R. 14 C.F.R. 91.103(a)(b)(1) and (2): Preflight procedures and action.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.103(a)(b)(1)(2). This part provides:

> "Each pilot in command 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: … (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."

The Peace of Thorn Productions LLC pilot in command in fact will, before beginning a flight, become familiar with all available information concerning that flight. However, as the flights of the sUAS will not be at airports the information required of Part 91.103(b)(2) does not apply. However, as a condition to the approval of exemption, Peace of Thorn Productions LLC shall perform preflight operations as outlined previously in this Petition.

S. 14 C.F.R. 91.105: Flight crewmembers at stations.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.105 since this part is not applicable due to the sUAS carrying no flight crewmembers. However, to achieve an equivalent level of safety, Peace of Thorn Productions LLC will not operate the aircraft unless someone is at the controls at all times.

T. 14 C.F.R. 91.109: Flight instruction; Simulated instrument flight and certain flight tests.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.109.

This part 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. Remotely piloted aircraft, including the sUAS here, 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 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 is provided by the very limited size and speed of the aircraft and by the fact that neither a pilot nor passengers will be carried in the aircraft.

U. 14 C.F.R. 91.113(b): Right-of-way rules: Except water operations.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 113(b) to the extent that it applies to overhead aircraft operating at or above 600 feet AGL as the sUAS will be operating no higher than 400 feet AGL. This part provides:

> "(b): General. When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft. When a rule of this section gives another aircraft the right-of-way, the pilot shall give way to that aircraft and may not pass over, under, or ahead of it unless well clear."

For example, if another aircraft is operating overhead at 10,000 feet AGL there is no danger posed to that other aircraft if the sUAS is operating under it or ahead of it at or beneath 400 feet AGL. However, as a condition to the approval of exemption, Peace of Thorn Productions LLC will operate its sUAS to see and avoid and give way to other aircraft that should enter airspace at or below 400 feet AGL.

V. 14 C.F.R. 91.115: Right-of-way rules: water operations.

This Part does not apply as Peace of Thorn Productions LLC does not plan on operations on or over bodies of water in the near future.

W. 14 C.F.R. 91.119: Takeoff and Landing.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.119. Section 91.119 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 (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.

Peace of Thorn Productions LLC will not operate the sUASs any higher than 400 feet AGL. Furthermore, while Peace of Thorn Productions LLC will not be operating over any congested areas, the sUASs will necessarily be flown closer to 500 feet to the structures it will be examining (as well as closer than 500 feet to the ground).

The operations by Peace of Thorn Productions LLC of the sUASs as set out previously provide for at least an equivalent level of safety of manned aircraft maintaining a distance of at least "500 feet to any person, vessel, vehicle, or structure" due to the small size and relatively light weight of the sUAS; and the close monitoring of the flight by both the pilot in command and the secondary ground crewmember.

Peace of Thorn Productions LLC will however be operated in a restricted area with security perimeter, where buildings and people will not be exposed to operations without their pre-obtained consent. Also, 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 participants in the filming activity, all affected individuals will be aware of the planned flight operations as set forth herein.

Compared to flight operations with aircraft or rotorcraft weighting 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 the movie industry. In addition, the low-altitude operations of the sUASs will ensure separation between these small-UASs operations and the operations of conventional aircraft that must comply with Section 91.119.

X. 14 C.F.R. 91.119(b) and (c): Minimum safe altitudes: General.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.119 subparts (b) and (c). This regulation provides:

> "Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:...
>
> (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."

Peace of Thorn Productions LLC will not operate the sUAS any higher than 400 feet AGL. Furthermore, while Peace of Thorn Productions LLC 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 (as well as closer than 500 feet to the ground).

The operations by Peace of Thorn Productions LLC of the sUAS as set out previously provide for at least an equivalent level of safety of manned aircraft maintaining a distance of at least "500 feet to any person, vessel, vehicle, or structure" due to the small size and relatively light weight of the sUAS; and the close monitoring of the flight by both the pilot in command and the secondary ground crewmember.

Peace of Thorn Productions LLC will however be operated in a restricted area with security perimeter, where buildings and people will not be exposed to operations without their pre-obtained consent. Also, 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 participants in the filming activity, all affected individuals will be aware of the planned flight operations as set forth herein. Compared to flight operations with aircraft or rotorcraft weighting 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 the movie industry. In addition, the low-altitude operations of the sUASs will ensure separation between these small-UASs operations and the operations of conventional aircraft that must comply with Section 91.119.

Y. 14 C.F.R. 91.121: Altimeter Settings.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.121. This Part provides guidelines for altimeter use below 18,000 feet mean sea level ("MSL") in maintaining the cruising altitude or flight level of the aircraft. Peace of Thorn Productions LLC's operation of the sUAS will not exceed 400 feet AGL and will be operated in a fashion that is not a sustained cruising flight such as a manned aircraft will typically fly. The laptop used in the ground station has live feedback information about the sUAS, including but not limited to the height of the sUAS, its forward velocity, and compass heading. The operator will be able to observe and control the maximum height of the sUAS. Additionally, the sUAS will be operated within the line of sight. Therefore, the equivalent level of safety provided by Section 91.121 will be met.

Z. 14 C.F.R. 91.151: Fuel requirements for flight in VFR conditions.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. Part 91.151. This Part provides that:

> "(a) No person may begin 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
>
> (b) No person may begin a flight in a rotorcraft 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, to fly after that for at least 20 minutes."

The sUASs Peace of Thorn Productions LLC will fly is electric in nature, using lithium polymer batteries that currently have a flight limit of approximately no more than 15 minutes. Therefore, due to the limitations of the batteries it is currently impossible to comply with Part 91.151. However, the sUAS will be operated in a manner with at least the same equivalent of safety as that of a manned aircraft complying with Part 91.151 because the short distances the sUASs will be operated in, far less than one mile, will allow the sUASs to be flown to a safe landing point within the area of operation within a short period of time and well within the minimum level of reserve capacity of the batteries.

During the entire preprogrammed flight, the operator will always have a visual line of sight and be prepared to take over. Pilot's radio transmitter ("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 sUASs back to the roped off "home" area. This operation procedure adequately complies with ASTM standard F3005 − 14 4.3.1 (Standard Specification for Batteries for Use in Small Unmanned Aircraft Systems (sUAS)). The timer begins from the point the throttle is moved out of its start position.

The battery powering the sUAS provides approximately 15 minutes of powered flight. As a result, the sUAS would never meet the 30 minute reserve requirement. Given the limitations on the sUAS's proposed flight area and the location of its proposed operations within a predetermined area, a longer time frame for flight in daylight VFR conditions is reasonable. Peace of Thorn productions 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 Section 91.151 (a)). Given the limited size and speed of the sUAS, its ability to land safely almost anywhere, that it will be under the operator and the observer's visual observation at all times, and that it will be operating in a tightly controlled area, where all people, other than the operator and the observer, 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.

Peace of Thorn Productions LLC believes that an equivalent level of safety can be achieved by limiting flights to 12 minutes or the time when 20% of battery power remains, whichever happens first. This restriction would be more than adequate to allow the sUAS to reach its planned landing zone. Similar exemptions have been granted to other operations, including Exemptions 2689F, 5745, 10673, and 10808.

AA. 14 C.F.R. 91.203(a) and (b): Civil aircraft: Certifications required.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.203(a) and (b). This section 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…
>
> (2) An effective U.S. registration certificate issued to its owner…
>
> (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."

First, there are currently no procedures by the FAA for providing airworthiness certificates for sUAS. However, as a condition to the approval of exemption, Peace of Thorn Productions LLC 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 them.

Second, the sUAS Peace of Thorn Productions LLC will use the DJI S800 EVO or Phantom II or similar, which has an equivalent level of safety as manned aircraft with an airworthiness certificate. Both the DJI A2 and the DJI 2.4 GHz ISM; Intelligent Orientation Control (IOC) flight controller provides a number of safety features in addition to acting as the command and control Rx bound to the Futaba brand Tx, including automatic return to home if the radio control link is broken, referred to as a failsafe.

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, both the DJI A2 and the DJI 2.4 GHz ISM; Intelligent Orientation Control (IOC) 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 that has 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 1, 2).

In the restricted environment and under the conditions proposed, operation of the sUASs

will be at least as safe as a conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate without the restrictions and conditions proposed. Peace of Thorn Productions LLC 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.

The sUAS to be operated hereunder is less than 15 pounds inclusive of batteries and technical payload, carries neither a pilot nor passengers, and carries no explosive materials or flammable liquid fuels. The sUASs operating under this exemption will be tightly controlled and monitored by the operator and the observer, 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 issued under 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 inability to carry a substantial payload.

BB. 14 C.F.R. 91.215: ATC Transponder and Altitude Reporting Equipment and Use.

This section requires that installed Air Traffic Control (ATC) transponder equipment must meet specific performance and environmental requirements, and aircraft must be equipped with an operable coded radar beacon transponder.

There are presently no known commercially available ATC transponders that meet the payload requirements of a sUAS and are available at reasonable cost. However, because the sUASs used by Peace of Thorn Productions LLC will not be flying into or near airports, and will fly no higher than 400 feet AGL, there is very low risk of collision with any manned aircraft. In addition, because there will be no need to have contemporaneous communication with Air Traffic Control, due to the short distances, short flight times, and restricted altitude the sUASs will operate within, Peace of Thorn Productions LLC requests an exemption from this section. Additionally, the sUAS is too small to contain ATC transponder equipment in any form factor that is known to be available commercially.

CC. 14 C.F.R. 91.403: General.

This section requires that the owner or operator of an aircraft is primarily responsible for maintaining that aircraft in an airworthy condition. Peace of Thorn Productions LLC will adhere to this requirement.

However, this Section also limits maintenance to that "prescribed in this subpart and other applicable regulations, including part 43 of this chapter." Because of this limitation, and because of the exemptions under Part 43 requested above, Peace of Thorn Productions LLC requests an exemption from this Section.

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, and use in controlled rural environments on private, secured land, as described previously in this petition.

DD. 14 C.F.R. 91.405 (a) and (d): Maintenance Required.

This section requires that aircraft be inspected as proscribed by Section E, 14 C.F.R. §§91.401-91.421. As shown below, Peace of Thorn Productions LLC is applying for an exemption for these sections, due to the fact that its operators will inspect the sUAS prior to each flight and keep maintenance records of all parts that are replaced. Because the Sections discussed below are concerned with manned aircraft, and as such have inspection requirements designed for the safety of passengers, they are inapplicable to Peace of Thorn Productions LLC.

Peace of Thorn Productions LLC is also applying for an exemption to subpart (d) of this section, which requires a placard to be installed and references §43.11. As noted previously, Peace of Thorn Productions LLC requests an exemption to the placard requirement, because, due to the small size of the sUAS, there is no room to place the placard. As an alternative and to achieve an equivalent level of safety, Peace of Thorn Productions LLC will keep logbooks detailing all repairs.

Despite the requested exemption from subparts (a) and (d) of this section, Peace of Thorn Productions LLC will follow subparts (b) and (c) of this subpart.

EE. 14 C.F.R. 91.407: Operation after maintenance, preventive maintenance, rebuilding, or alteration.

This section requires that any aircraft which "has undergone maintenance, preventative maintenance, rebuilding, or alteration unless . . . [i]t has been approved for return to service by a person authorized under § 43.7 of this chapter . . .."

However, Peace of Thorn Productions LLC has requested an exemption from §§ 43.7 and 43.11 as described previously.

The capability of the operators to maintain and repair the sUAS meets the requirements for an equivalent level of safety pursuant to Section 333 for both types of sUASs, its intended use, and the operating environment. Additionally, due to the small size of the sUAS, there is no room to place inspection placards.

Therefore, because Peace of Thorn Productions LLC has requested an exemption from 43.7 and 43.11, Peace of Thorn Productions LLC respectfully requests an exemption from 91.407. To achieve an equivalent level of safety, Peace of Thorn Productions LLC will regularly inspect and maintain its sUASs in accordance with the DJI operator manual, and keep detailed inspection records as described above.

FF. 14 C.F.R. 91.407(a)(1): Operation after maintenance, preventive maintenance, rebuilding or alteration.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. Part 91.407(a)(1). This Part provides that:

Any aircraft which "has undergone maintenance, preventative maintenance, rebuilding, or alteration unless . . . [i]t has been approved for return to service by a person authorized under § 43.7 of this chapter . . .."

However, Peace of Thorn Productions LLC has requested an exemption from §§ 43.7 and 43.11 as described previously. The capability of the operators to maintain and repair the sUAS meets the requirements for an equivalent level of safety pursuant to Section 333 for both types of sUASs, its intended use, and the operating environment. Additionally, due to the small size of the sUASs, there is no room to place inspection placards.

Therefore, because Peace of Thorn Productions LLC has requested an exemption from 43.7 and 43.11, Peace of Thorn Productions LLC respectfully requests an exemption from 91.407. To achieve an equivalent level of safety, Peace of Thorn Productions LLC will regularly inspect and maintain its sUASs in accordance with the DJI operator manual, and keep detailed inspection records as described above.

GG. 14 C.F.R. 91.409: Inspections.

This section lays out the requirements for inspections of aircraft. Peace of Thorn Productions LLC respectfully requests an exemption from these requirements because they are intended to maintain the safety of manned aircraft significantly larger and capable of significantly longer flights than the Phantom II and the DJI S800.

Peace of Thorn Productions LLC does have an inspection procedure. Prior to each flight, the operator will conduct an inspection of the sUAS. The steps of this pre-flight inspection include:

a). Check the following proponents for damage during transport:
Airframe;
Connections; and
Propellers.

b) Calibrate the camera.

c) Verify voltage and settings for main flight Tx and the gimbal Tx.

d) Measure voltage for dual battery.

e) Cycle through different control modes of the Flight Tx observing LED lights for good connection and response.

f) Cycle through all controls of the Gimbal Tx making sure the gimbal and camera respond to commands.

g) Activate engine power without moving throttle up to check that the automatic throttle kill works.

After each flight, Peace of Thorn Productions LLC will conduct the following post-flight inspection:

a) Blow sUAS with compressed air to remove dirt and dust.

b) Wipe down sUAS with a cloth to remove dirt and dust.

c) Check each electrical connection to make sure it is still intact.

The pre-flight and post-flight inspections meet or exceed the level of safety achieved by adherence to 14 C.F.R. 91.409.

HH. 14 C.F.R. 91.409(a)(2): aircraft issuance of airworthiness certificate inspection.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.203(a) and (b). This section provides in 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 of this chapter.

This section lays out the requirements for inspections of aircraft.

Peace of Thorn Productions LLC respectfully requests an exemption from these requirements because they are intended to maintain the safety of manned aircraft significantly larger and capable of significantly longer flights than the Phantom II and the DJI S800.

Peace of Thorn Productions LLC does have an inspection procedure. Prior to each flight, the operator will conduct an inspection of the sUAS. The steps of this pre-flight inspection include:

a). Check the following proponents for damage during transport:
Airframe;
Connections; and
Propellers.

b) Calibrate the camera.

c) Verify voltage and settings for main flight Tx and the gimbal Tx.

d) Measure voltage for dual battery.

e) Cycle through different control modes of the Flight Tx observing LED lights for good connection and response.

f) Cycle through all controls of the Gimbal Tx making sure the gimbal and camera respond to commands.

g) Activate engine power without moving throttle up to check that the automatic throttle kill works.

After each flight, Peace of Thorn Productions LLC will conduct the following post-flight inspection:

a) Blow sUAS with compressed air to remove dirt and dust.

b) Wipe down sUAS with a cloth to remove dirt and dust.

c) Check each electrical connection to make sure it is still intact.

The pre-flight and post-flight inspections meet or exceed the level of safety achieved by adherence to 14 C.F.R. 91.409.

II. 14 C.F.R. 91.417: Maintenance records.

Peace of Thorn Productions LLC respectfully requests an exemption from this Section, as it is only applicable for aircraft with an airworthiness certificate. Because Peace of Thorn Productions LLC will not have an airworthiness certificate, this Section is inapplicable. As an alternative and to achieve an equivalent level of safety, Peace of Thorn Productions LLC will keep detailed maintenance on every part as it is replaced, including but not limited to propellers, batteries, and electrical components.

JJ. 14 C.F.R. 91.417(a) and (b): Owner/Operator records of maintenance for aircraft.

Peace of Thorn Productions LLC requests an exemption from 14 C.F.R. 91.417(a) and (b). Section 91.417(a) and (b) prescribes, 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; and
>
> (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 which 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) of this chapter 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 of this chapter shall be retained until the defects are repaired and the aircraft is approved for return to service.

Peace of Thorn Productions LLC respectfully requests an exemption from this Section, as it is only applicable for aircraft with an airworthiness certificate. Because Peace of Thorn Productions LLC will not have an airworthiness certificate, this Section is inapplicable. As an alternative and to achieve an equivalent level of safety, Peace of Thorn Productions LLC will keep detailed maintenance on every part as it is replaced, including but not limited to propellers, batteries, and electrical components.

Exhibit 1: Aerial Inspection Procedures

Location:

Under contract with a utility company, community municipality within and surrounding the vicinity of Chicago, Illinois and Northwest Indiana counties of Lake and Porter activities of commercial utilization of sUASs infrastructure inspection will commence. The utility companies, community municipalities properties are privately owned with some located in rural and semi-rural areas. Vast majorities of the properties owned by the utility companies and community municipalities are fenced off and host some sort of security presence which restricts public access and which also provides safety for the public. All of the utility companies' and community municipalities' properties are in Class G airspace.

Purpose of Flight:

The primary purpose of work is to safely, accurately, and efficiently create aerial utility company and community municipality material inspection imaging. The sUAS will video tape, and collect video photographs, which will allow for the inspection of equipment to determine maintenance and repairs, and use specialized video, and photography software to process, prepare, and display the results. The final imaging output will be HD high resolution aerial imaging.

Flight Crew, Equipment and Typical Flight:

For information regarding the flight crew, equipment, and typical flight, please refer to pages three through ten of the petition, above.

Current Methods:

Currently these utility company inspection operations involve having a crew of 4 or 5 technicians with two or three persons spending hours prepping, mounting and then climbing electrical towers to inspect for damage and worn out material at each tower location under dangerous conditions, and with the risk of life threatening scenarios. Moreover, another current practice of utility company inspection operations involve the use of a helicopter with 3 or 4 persons flying at very low altitude trying to achieve an aerial visualization of damaged and worn out tower structure and electrical wiring material which is extremely dangerous for all involved including surrounding structures and high power electrical lines with the risk of property damage, human injury or worst death. In contrast, a sUAS weighing less than 15lbs. and is powered by batteries eliminates virtually all of the risk for property damage, human injury, or death.

Exhibit 2: Aerial Photography Procedures

Locations:

These locations are spread across the Chicago metropolitan area, encompassing portions of Northwest Indian counties of Porter and Lake. The photography areas will be accessed with the permission and consent of those owning and willing to be photographed. Many if not all areas are in Class G airspace. Finally, many of these photography areas host secured boundaries with limited public access and others exist in public areas.

Purpose of Flight:

The primary purpose of the work is to safely, accurately, and efficiently create aerial scenic photographic, and cinematographic pictures for public viewing via art gallery, Flicker Website, YouTube, film and videography display. This is comprised of HD high resolution aerial imaging. The work is done using a sUAS to collect photos or pictures, and specialized photo and video software to process the data.

Flight Crew, Equipment and Typical Flight:

For information regarding the flight crew, equipment, and typical flight, please refer to pages three and ten of the petition, above.

Current Methods:

Currently these types of aerial scenic photographic and cinematographic pictures are taken and require a helicopter involving two to four or five persons flying at very low altitude trying to achieve an aerial photo or picture which is extremely dangerous for all involved including surrounding structures and high power electrical lines with the risk of property damage or worst death. In addition, motor vehicles with mounted film cranes which extent 25 to 30 feet over and past the motor vehicle's center of gravity requirements to achieve an aerial photo or picture effect are currently used which is also very dangerous for all involved because of the high risk of the motor vehicle crashing into people, other motor vehicles, and buildings causing property damage, human injury or death. By flying over a scene using a sUAS these hazards are removed. Further the sUAS can do the work in under 15 minutes which previously took two too four men multiple hours to do.

Exhibit 3: Scripted Closed-Set Filming and Videography

Location:

These locations are spread across the Chicago metropolitan area, and encompassing portions of Northwest Indian counties of Porter and Lake. The secured scripted closed-set filming and videotaping areas will be accessed only with permission, and consent of those in the film and video. These areas are abundant with aerial scenic, photographic, and cinematographic opportunities with many areas providing secured time limited access which greatly reduces hazardous conditions for the public. These areas are over 10 miles away from any major or minimal municipality airport, and are in Class G airspace to protect the public from hazardous conditions.

Purpose of Flight:

The primary purpose of the work is to safely, accurately, and efficiently create aerial scenic, photographic, cinematographic imaging. The sUAS will film, video tape, and collect photographs of scripted closed-set scenes acted out by actors and actresses, and use specialized film, video, and photography software to process, prepare, and display the results. The final imaging output will be HD high resolution aerial imaging.

Flight Crew, Equipment and Typical Flight:

For information regarding the flight crew, equipment, and typical flight, please refer to pages three and ten of the petition, above.

Current Methods:

Currently these types of scripted closed-set aerial scenic photographic and cinematographic pictures are taken and require a helicopter involving two to four or five persons flying at very low altitude trying to achieve an aerial scene which is extremely dangerous for all involved including surrounding structures and high power electrical lines with the risk of property damage or worst death. In addition, motor vehicles with mounted film cranes which extent 25 to 30 feet over and past the motor vehicle's center of gravity requirements to achieve an aerial scenic effect are currently used which is also very dangerous for all involved because of the high risk of the motor vehicle crashing into people, other motor vehicles, and buildings causing property damage, human injury or death.

By flying over a scene using a sUAS these hazards are removed. By flying over a scene using a sUAS these hazards are removed. Further the sUAS can do the work in under 15 minutes which previously took two to four men multiple hours to do.

Exhibit 4:

DJI Phantom II User Manual

Please see attachment Title:

Phantom II_User_Manual_v1.2_en.pdf

Exhibit 5

DJI Phantom II Specs

Please see attachment Title:

Phantom II Specs.pdf

Exhibit 6

Spreading Wings S800 EVO User Manual

Please see attachment Title:

S800_EVO_User_Manual_v1.10_en.pdf

Exhibit 7

Spreading Wings S800 Specs

Please see attachment Title:

Spreading Wings S800 EVO Specs.pdf

Exhibit 8

A2 Flight Control System User Manual

Please see attachment Title:

A2_Quick_Start_Guide_v1.2_en.pdf

A2_Quick_Start_Guide_v1.04_en.pdf

Exhibit 9

A2 Flight Controller Features

Please see attachment Title:

A2_Quick_Start_Guide_v1.04_en.pdf

Exhibit 10

A2 A New Standard in Flight Control

Please see attachment Title:

A2 A New Standard in Flight Control.pdf

Exhibit 11

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 (2000)

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Exhibit 12

Williams, K.W. (2007). ***Unmanned Aircraft Pilot Medical Certification Requirements,*** **Report DOT/FAA/Am-07/3, FAA Civil Aerospace Medical Institute**

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Exhibit 13

McCarley, J.S. and Wickens, C.D. (2004). *Human Factors Implications of UAV's in the National Airspace.* Institute of Aviation, Aviation Human Factors Division. University of Illinois at Urbana-Champaign.

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