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

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

July 23, 2015

Exemption No. 12124
Regulatory Docket No. FAA–2015–1592

Mr. Francisco A. Rullan
Legal Counsel
Ericsson Caribbean, Inc.
City View Plaza II
Guaynabo, PR 00968

Dear Mr. Rullan:

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

By letter dated April 30, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Ericsson Caribbean, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography and visual surveys.

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

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

Airworthiness Certification

The UAS proposed by the petitioner is a DJI Phantom 2 Vision+.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in

consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

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

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

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

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, Ericsson Caribbean, Inc. is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

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

Conditions and Limitations

In this grant of exemption, Ericsson Caribbean, Inc. is hereafter referred to as the operator.

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

1. Operations authorized by this grant of exemption are limited to the DJI Phantom 2 Vision+ when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

2. Operations for the purpose of closed-set motion picture and television filming are not permitted.

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

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

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

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

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

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

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

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

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

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

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

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

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be

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

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

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

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

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

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

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

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

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification

(N−Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Enclosures

ERICSSON

April 30, 2015

U. S. Department of Transportation Docket Management System
1200 New Jersey Ave., SE
Washington, DC 20590

Dear Sir or Madam:

Attached please find Ericsson Caribbean, Inc.'s ("Ericsson") request for an exemption from the listed Federal Aviation Regulations to allow commercial operation of its Small Unmanned Aircraft Systems ("sUASs") to conduct aerial photography and visual surveys for various data and telecommunication projects and installations as part of its service delivery to mobile telecommunication operators.

On March 4, 2015, Ericsson Ireland, an affiliate of Ericsson, obtained from the Irish Aviation Authority (IAA) in the Republic of Ireland a commercial license to execute the same type of activities as referred to in this letter.

Also attached to this letter is the sUAS Flight Operations Manual ("Operations Manual"), which outlines the operating requirements, limitations, and technical specifications for the sUAS. This Operations Manual was developed in Ericsson Ireland as part of the licensing requirements of the Government of Ireland but it has been modified and adapted to the conditions for sUAS operations within FAA controlled territory.

Applicant submits the Operations Manual as proprietary information pursuant to 14 CFR 11.35 (b). The Operations Manual contains operating conditions and procedures that are not available to the public and are protected from release under the Freedom of Information Act 5 USC 552 et. seq.

Thank you for your time and consideration, and please let us know if you have any questions.

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In a separate filing in this same docket we will also provide the following supporting documents:

1) Phantom 2 Vision Plus Pilot Training Guide
2) Phantom 2 Vision Plus User Manual
3) Flying Camera Project – Training Material
4) Remote Piloted Aircraft System (Drone) Site Risk Assessment Form
5) sUAS Checklist – DJI Phantom
6) sUAS Flight Records and Logs

Sincerely,

Francisco A. Rullan
Legal Counsel

Ericsson Caribbean, Inc.
City View Plaza II
Suite 6010
Guaynabo, PR 00968
Tel. 954-804-5724
Francisco.rullan@ericsson.com

ERICSSON

April 30, 2015

U. S. Department of Transportation Docket Management System
1200 New Jersey Ave., SE
Washington, DC 20590

Re: Exemption Request Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations from 14 CFR Part 21; 14 CFR 45.23 (b); 14 CFR 45.27 (a);
14 CFR 61.113 (a) & (b); 14 CFR 91.7 (a); 91.9 (b) (2); 91.103 (b); 91.105; 91.109; 91.119; 91.121; 91.151 (a); 91.203 (a) & (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); 91.417 (a) & (b); 8900.227 §16 (c) (4) and §16 (e) (1)

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 CFR. Part 11, Ericsson Caribbean, Inc. ("Ericsson"), a provider of telecommunications and data technology services, hereby applies for an exemption from the listed Federal Aviation Regulations ("FARs") to allow commercial operation of its Small Unmanned Aircraft Systems ("sUASs") for aerial photography and visual surveys of telecom sites ("sites") in various projects as part of the service delivery, 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.

As detailed in this document and the attached Operations Manual, the requested exemption would permit the operation of sUAS under controlled conditions in airspace that is 1) limited, 2) predetermined, 3) controlled as to access, and 4) would provide safety enhancements to the already best practices safety protocols followed by Ericsson at each one of its sites. Approval of this exemption would thereby enhance safety and fulfill the Secretary of Transportation's (the FAA Administrator's) responsibilities to "...establish requirements for the safe operation of such aircraft systems in the national airspace system." Section 333 (c) of the Reform Act.

The name and address of the applicant is:

Ericsson Caribbean, Inc.

City View Plaza Tower II

Suite 6010

Guaynabo, Puerto Rico 00968

USA

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Regulations from which the exemption is requested:

14 CFR Part 21
14 CFR 45.23 (b)
14 CFR 45.27 (a)
14 CFR 61.113 (a) & (b)
14 CFR 91.7 (a)
14 CFR 91.9 (b) (2)
14 CFR 91.103
14 CFR 91.105
14 CFR 91.109
14 CFR 91.119
14 CFR 91.121
14 CFR 91.151 (a)
14 CFR 91.203 (a) & (b)
14 CFR 91.405 (a)
14 CFR 407 (a) (1)
14 CFR 409 (a) (2)
14 CFR 417 (a) & (b)
8900.227 §16 (c) (4) and §16 (e) (1)

I. STATUTORY AUTHORITY FOR EXEMPTIONS

The Federal Aviation Act expressly grants the FAA authority to issue exemptions. This statutory authority includes exempting civil aircraft, as the term is defined under §40101 of the Act, including sUASs, from the requirement that all civil aircraft must have a current airworthiness certificate.

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

Section 333(b) of the Reform Act assists the Secretary in determining whether sUASs may operate in the National Airspace System (NAS) without creating a hazard to the user, the public, or a threat to national security. In making this determination, the Secretary must consider:

- The sUAS's size, weight, speed, and operational capability;
- Whether the sUAS operates within the visual line of sight of the operator
- Whether the sUAS operates outside of highly populated areas and away from close proximity to airports

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

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Ericsson's sUASs are multirotor vehicles, weighting 10 lbs. or less including payload. They operate under normal conditions at a speed of no more than 50 knots and have the capability to hover and move in the vertical and horizontal plane simultaneously. The sUASs will operate only in the pilot's and/or assistants visual line of sight at all times and will operate within the restricted private areas as described in the Flight Operations Manual, attached as Exhibit 1 (hereinafter "the Operations Manual") Adherence to the Manual will insure that the sUASs will "not create a hazard to users of the national airspace system or the public." Reform Act Section 333 (b).

Given the small size of the sUASs involved and the restricted and sterile environment within which they will operate, our application falls squarely within the zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of sUASs to commence immediately.

Also due to the small size of the sUASs and the low altitudes (less than 400 feet AGL) and restricted private areas in which our sUASs will operate, approval of the application presents no national security issue.

Given the clear direction in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, as amended; the strong equivalent level of safety surrounding the proposed operations, and the significant public benefit, including enhanced safety, the grant of the requested exemptions is in the public interest. Accordingly, Ericsson respectfully requests that the FAA grant the requested exemption without delay.

II. PUBLIC INTEREST

This exemption application is expressly submitted to fulfill Congress' goal in passing Section 333 (a) through (c) of the Reform Act. This law directs the Secretary of Transportation to consider whether certain unmanned aircraft systems may operate safely in the NAS before completion of the rulemaking required under Section 332 of the Reform Act. By granting an exemption the FAA will fulfill Congress's intent of allowing UAS to operate with significant safety precautions in low risk environments.

The use of sUASs on a site can significantly reduce the risk to workers of falls while surveying, inspecting or monitoring site progress (e.g., some of the cell towers in Puerto Rico are as tall as 300 feet). sUASs can inspect, photograph, and collect data on hard to get to areas that otherwise would require worker inspection. Falls are the leading source of workplace fatality and injury on construction sites[1], and reducing falls through sUAS use for site imaging could save workers lives.

Additionally, sUASs could replace the use of helicopters and small aircraft to monitor telecom sites. The sUASs we propose to fly in this application have a weight less than 10 pounds, and carry no combustible material on board, as opposed to the much larger conventionally powered small aircraft. Shifting to sUASs from helicopters presents a marked safety increase for our workers and the public.

Lastly, sUASs reduce the environmental impact by dramatically decreasing the energy used for aerial imaging and data collection over a site. Our sUASs use rechargeable

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lithium ion batteries, as opposed to fossil fuels burned in operation of small aircraft that are many hundreds of times heavier.

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[1] "Commonly Used Statistics", Occupational Safety & Health Administration. Available at: https://www.osha.gov/oshstats/commonstats.html

III. EQUIVALENT LEVEL OF SAFETY

Ericsson proposes that the exemption requested herein apply to civil aircraft that have the characteristics and that operate with the limitations listed herein. These limitations provide for at least an equivalent or even higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to the already safe protocols followed on data and telecommunication sites and imaging and surveying operations conducted with helicopters and other conventional aircraft.

Ericsson will be bound by the following limitations when conducting its sUAS operations under an FAA issued exemption:

1. Safety will be the first and foremost consideration in any sUAS operation.
2. The MTOM weight of the sUAS will be less than 10 lbs.
3. Minimum crew for each operation will consist of the sUAS PIC.
4. An observer will be utilized if the sUAS in any case will be flown outside line of sight for the pilot. Flights therefore always will be operated within line of sight of the pilot and/or an assistant at all times. The observer, if required and pilot will at all times be able to communicate by voice and/or text.
5. Maximum total flight time for each operational flight will be 25 minutes. The sUAS calculates battery reserve in real time. The sUAS has two levels of low battery capacity warning. The first appears when the battery has less than 30% power and the second appears when it has less than 15% power. The sUAS will return to its ground station with at least 15% battery power reserve should that occur prior to the 25 minute flight time.
6. Flights will be operated normally at an altitude of 200 feet AGL, never exceeding 400 feet AGL.
7. Flights will be operated in Class G airspace whenever possible. If operation in other airspace is required, the relevant controlling agency will be notified at least 24 hours prior to the operation and, if required, any necessary permission obtained.
8. Flights will be operated at daylight and under visibility and cloud clearance requirements equivalent to Visual Flight Rules (VFR).
9. The sUAS will at all times give way to any aircraft carrying persons.

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10. Prior to a sUAS flight, an area of operation will be established. This area of operation will include a defined lateral and vertical area, where the sUAS will operate. Safety procedures will be established for persons, property and applicable airspace within the area of operation.
11. Ericsson's sUAS aircraft will utilize GPS navigation, failsafe, automatic Return-To-Home (RTH) and/or flight abort safety features when appropriate for the operation.
12. A briefing will be conducted in regard to the planned sUAS operations prior to operation at each new location. All personnel who will be performing duties within the boundaries of the area of operation will be present for this briefing.
13. All required permissions and permits will be obtained from appropriate state, county or city jurisdictions, including local law enforcement, fire, or other appropriate governmental agencies.
14. Written and/or oral permission from the relevant property owners will be obtained prior to an operation.
15. The pilot will have been trained in operation of sUASs generally and received up-to-date information on the particular sUAS to be operated as required in the Operations Manual.
16. The pilot must poses at least a second class medical certificate
17. The sUAS pilot will be trained in advance for the safe operation of the sUAS to be operated. This will include operation of the sUAS both in normal and emergency modes of operation, and will include familiarization with the Operations Manual. Training will also include types of maneuvers to be performed and the safe operation in relation to persons, property and applicable airspace.
18. The sUAS pilot will establish a working relationship with a representative at the local Flight Standards District Offices (FSDO) with which to annually review safety procedures and other operations to further enhance safety.

IV. DESCRIPTION OF SPECIFIC REGULATIONS

14 CFR Part 21, Subpart H: Airworthiness Certificates 14 CFR 91.203 (a) (1)
Subpart II, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR 91.203 (a) (1). Given the size and limited operating area associated with the aircraft to be utilized by the Ericsson, an exemption from Part 21 Subpart **H** meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act. The Federal Aviation Act (49 U.S.C.§44701 (f)) and Section 333 of the Reform Act both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular UAS. In our particular case, the sUASs that we are intending to use are small, and will operate at slow speeds, close to the ground, far from airports and in a low risk, low population environment. An analysis of these criteria demonstrates that the sUAS operated without an

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airworthiness certificate, in the restricted environment and under the conditions proposed will be at least as safe, or safer, than a conventional aircraft (fixed wing or helicopter) operating with an airworthiness certificate without the restrictions and conditions proposed.

The sUAS to be operated hereunder is less than 10 lbs. fully loaded, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a secured area as set out in the Operations Manual. Like other civil aircraft, operations under this exemption will be tightly controlled and monitored by the operator, pursuant to the Operations Manual's requirements, and under the requirements and in compliance with local public safety requirements, to provide security for the area of operation as is currently done on active sites. The FAA will have advance notice of all operations.

These safety enhancements, which already apply to civil aircraft operated in connection with sites, provide a greater degree of safety to the public and property owners than conventional operations conducted with airworthiness certificates issued under 14 CFR Part 21, Subpart **H.** Lastly, application of these same criteria demonstrates that there is no credible threat to national security posed by the sUAS, due to its size, speed of operation, location of operation, lack of explosive materials or flammable liquid fuels, and ability to carry an external load no greater than two lbs.

14 CFR 45.23 (b): Marking of the Aircraft and 14 CFR 45.27 (a): Location of marks; nonfixed-wing aircraft

This regulation requires certain experimental, provisionally certificated aircraft, or light-sport category aircraft to be marked with letters between 2 inches and 6 inches high "limited," "restricted," "light-sport," "experimental," or "provisional," near each entrance to a cabin, cockpit, or pilot station.

Even though the sUAS will have no airworthiness certificate, an exemption may be needed as the sUAS will have no entrance to the cabin, cockpit or pilot station on which the word "Experimental" can be placed. Given the size of the sUAS, two-inch lettering will be impossible.

The equivalent level of safety will be provided by having the sUAS marked with the word "Experimental" will be placed one of the arms of the sUAS in compliance with 45.29 (f) and on both sides of the UAS in compliance with 45.27 (a) where the pilot, observer and others working with the sUAS will see the identification of the sUAS as "Experimental." The FAA has issued the following exemptions to this regulation: Exemptions Nos. 10700, 8738, 10167 and 10167A.

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

Sections 61.113 (a) & (b) limit private pilots to non-commercial operations. Because the sUAS will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations by requiring the pilot operating the aircraft to have completed a sUAS flight training course of at least 50 hours before flying a sUAS. Unlike a conventional aircraft that carries the pilot and passengers, the sUAS is remotely controlled with no living thing or cargo on board. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance as set forth in the Operations Manual. 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 pilot who has met the minimum requirements stated in chapter 2.2 of the Operations Manual exceeds the present level of safety achieved by 14 CFR 61.113 (a) & (b).

14 CFR 91.7 (a): Civil aircraft airworthiness

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

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

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

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

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14 CFR 91.103: Preflight Action
This regulation requires each pilot in command take certain actions before flight to ensure the safety of flight. An exemption is needed from this requirement as the pilot will take separate preflight actions, including checking for weather conditions, checking flight battery requirements, checking takeoff and landing distances, and all other actions in the Preflight Checklist in the Manual. These actions will provide an equivalent level of safety.

14 CFR 91.105: Flight crewmembers at stations
This regulation defines the obligations of the flight crewmembers during takeoff and landing, and while en route. This part is not applicable due to the sUAS is not carrying any flight crewmembers.

Ericsson will not operate the aircraft unless someone is at the controls at all times. Each flight will be manual, with the exception when the sUAS goes into emergency mode like return-to-home. This will achieve an equivalent level of safety to 14 CFR. 91.105, because the flight crew will be at their stations at all times during the flight. The stations will not be on the aircraft but on the ground.

14 CFR 91.109: Flight Instruction
Section 91.103 provides that no person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls.

By design, sUASs and remotely piloted aircraft do not have fully functional dual controls. Flight control is accomplished through the use of a control box that communicates with the aircraft via radio communications. The FAA has previously approved exemptions for aircraft without fully functional dual controls. See Exemption Nos.5778K & 9862A. The equivalent level of safety provided by the fact that neither a pilot nor passengers will be carried in the aircraft, the ability to control the sUAS via radio signals from the controller, and by the size and speed of the aircraft.

14 CFR 91.119: Minimum Safe Altitudes

Section 91.119 establishes safe altitudes for operation of civil aircraft. Section 91.119 (d) allows helicopters to be operated at less than the minimums prescribed, provided the person operating the helicopter complies with any route or altitudes prescribed for helicopters by the FAA. This exemption is for a multirotor craft that flies similarly to a helicopter, with vertical take-off and vertical landing, which will typically operate at altitudes of 200 feet AGL, so an exemption may be needed to allow such operations. The sUAS will never operate at altitude higher than 400 feet AGL and will be in a restricted area with security perimeter, where buildings and people will not be exposed to operations without their pre-obtained consent. See Manual for detailed procedures.

The equivalent level of safety will be achieved given the size, weight, speed of the sUAS as well as the location where it is operated. No flight will be taken without the permission of the property owner or local officials. Because of the advance notice to the property owner and any onsite personnel as outlined in the Manual, all affected individuals will be aware of the planned flight operations. Compared to flight operations with aircraft or rotorcraft weighting far more than the maximum 10 lbs. proposed herein and carrying flammable fuel, any risk associated with our operations is far less than those presently presented with helicopters and other conventional aircraft operating at or below 500 feet AGL in the construction industry. In addition, the low-altitude operations of the sUAS will ensure separation between these sUAS operations and the operations of conventional aircraft that must comply with Section 91.119.

14 CFR 91.121: Altimeter Settings

This regulation requires each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "...to the elevation of the departure airport or an appropriate altimeter setting available before departure." As the sUAS may not have a barometric altimeter, but instead a GPS altitude read out, an exemption may be needed. An equivalent level of safety will be achieved by the operator, pursuant to the Manual and Safety Check list, confirming the altitude of the launch site shown on the GPS altitude indicator before flight.

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

Section 91.151 (a) outlines fuel requirements for beginning a flight in VFR conditions. Our sUAS is limited to operations in sterile and controlled environments as outlined in the Manual, and has a limited range and flight time which require an exemption from 14 CFR 91.151 (a).

The battery powering the sUAS provides approximately 25 minutes of powered flight. To meet the 30 minute reserve requirement in 14 CFR 91.151, sUAS flights would not be possible to perform. 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 is reasonable.

Ericsson believes that an exemption from 14 CFR 91.151 (a) falls within the scope of prior exemptions. See Exemption 11191 (allowing Singer's Creation to operate without compliance with FAR 91.151 (a)).

Operating the sUAS, in a tightly controlled area where only people and property owners or official representatives who have signed waivers will be allowed, with less than 30 minutes of reserve fuel, does not engender the type of risks that Section 91.151 (a) was intended to alleviate given the size and speed of the sUAS.

The sUAS calculates battery reserve in real time. The sUAS has two levels of low battery capacity warning that are presented on the monitoring system. The first appears when the battery has less than 30% power and the second appears when it has less

than 15% power. The sUAS will return to its ground station with at least 15% battery power reserve should that occur prior to the 25 minute flight time.

An equivalent level of safety can be achieved by limiting flights to 20 minutes, or enough battery reserve to ensure that the sUAS lands at the ground station with at least 15% of battery power (as determined by the onboard monitoring system and the pilot), whichever happens first. This restriction would be more than adequate to return the sUAS to its planned landing zone from anywhere in its limited operating area.

Similar exemptions have been granted to other operations, including Exemptions 2689F, 5745, 10673, 10808 and 11191.

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

The regulation provides in part:

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

(1) An appropriate and current airworthiness certificate. . . .
(b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

The sUAS fully loaded weighs no more than 10 lbs. and is operated without an onboard pilot. Therefore there is no ability or place to carry certification and registration documents or to display them on the sUAS.

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

14 CFR 91.405 (a); 407 (a) (1); 409 (a) (2); 417 (a) & (b): Maintenance inspections

These regulations require that an aircraft operator or owner "shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in part 43 of this chapter...," and others shall inspect or maintain the aircraft in compliance with Part 43.

Given that these section and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply to Ericsson. Maintenance will be accomplished by the operator pursuant to the flight manual and operating handbook as referenced in the Manual. An equivalent level of safety will be achieved because these sUASs are very limited in size and will carry a small payload and operate only in restricted areas for limited periods of time. If mechanical issues arise the sUAS can land immediately and

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will be operating from no higher than 400 feet AGL. As provided in the Manual, the operator will ensure that the sUAS is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance performed. Moreover, the operator is the person most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety.

8900.227 Paragraph 16 (c) (4) PIC Medical. and Paragraph 16 (e) (1) Observer Medical.

This policy provides that both the PIC and observer must have a valid FAA second-class medical certificate issued under part. 67 in order to perform as a pilot or observer. Requiring the crew to meet the same medical requirements as commercial pilot carrying passengers in a large aircraft is an unnecessary burden. We propose that the minimum medical requirements be vision corrected to 20/20 and a valid, state-issued driver's license. The risk of both the PIC and observer becoming incapacitated at the same time and suddenly is very low. Further, since the sUAS is operating close to the ground, it could be brought in for landing in a very short time if incapacitation was suspected. Finally, most sUAS's are equipped with an automatic return to home feature which would provide a final level of safety. We feel this would provide an equivalent level of safety.

Pursuant to 14 CFR Part 11, 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 CFR 21, subpart **H;** 14 CFR 45.23 (b); 45.27 (a);14 CFR 61.113(a) & (b); 14 CFR 91.7 (a); 91.9 (b) (2);91.103 (b); 91.105; 91.109; 91.119; 91.121; 91.151 (a);91.203 (a) & (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); 91.409 (a) (2) & 91.417 (a) & (b); 8900.227 §16 (c) (4) and §16 (e) (1) to operate commercially a small unmanned vehicle (55 lbs. or less) in various data and telecommunication projects and installations as part of the service delivery,

Approval of exemptions allowing commercial operations of sUASs in the data and telecommunication industry enhances safety while reducing risk. Manned aircraft monitoring and surveying creates a greater risk because the craft are much larger, have combustible fuel, and carry an onboard human pilot. In contrast, a sUAS weighing fewer than 10 lbs. and powered by batteries eliminates virtually all of that risk given the reduced mass and lack of combustible fuel carried on board. The sUAS will carry no passengers or crew and, therefore, will not expose them to the risks associated with manned aircraft flights.

The operation of sUASs, weighting less than 10 lbs., conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial operations. These lightweight aircraft operate at slow speeds, close to the ground, and in a sterile environment and, as a result, are far safer than conventional operations conducted with turbine helicopters operating in close proximity to the ground and people.

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Privacy

All flights will occur over controlled access private property with the private property owner's prior consent and knowledge. Images taken may include individuals who have also given consent to being filmed or otherwise have agreed to be in the area where aerial photography will take place.

Summary

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 sUASs in the telecom and data technology services industry pursuant to the Operations Manual appended hereto.

Sincerely,

Francisco A. Rullan
Legal Counsel

Ericsson Caribbean, Inc.
City View Plaza II
Suite 6010
Guaynabo, PR 00968
Tel. 954-804-5724
Francisco.rullan@ericsson.com

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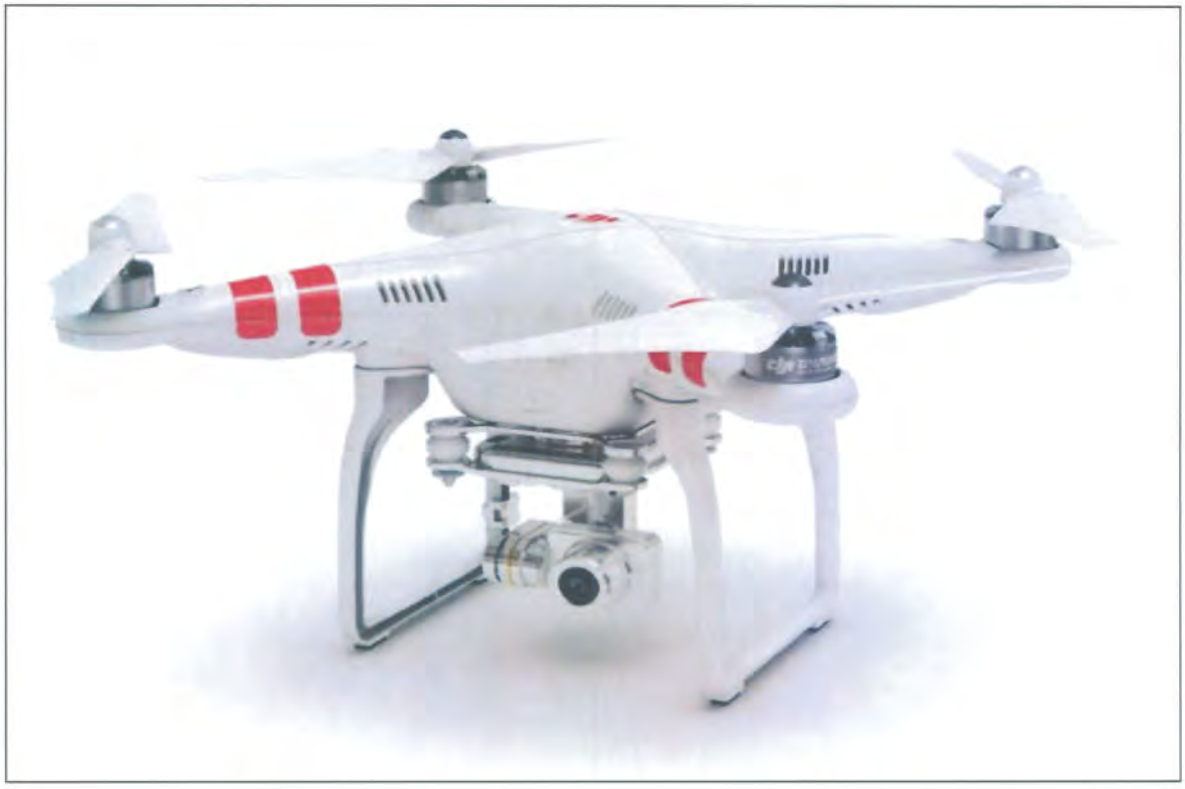
Ericsson Operational Manual

Small Unmanned Aircraft System (sUAS): Phantom 2 Vision+

PROCEDURE MANUAL



Rev B

Commitment of Accountable Manager

This Operations Manual describes the organization and procedures by which Ericsson Caribbean Inc. Puerto Rico carries out its Small Unmanned Aircraft Operations.

It is accepted that these procedures do not override the necessity of complying with any new or amended regulation published by the Federal Aviation Administration (FAA) from time to time, where these new or amended regulations are in conflict with these procedures.

Signed.....

For and on behalf of

Registered Company Name:	Ericsson Caribbean Inc. (EPR)
Registered Address:	City View Plaza
	48 Carr 165 Suite 6010
	Guaynabo PR 00968
	Puerto Rico, USA.

Enquiries regarding the content of this document should be addressed to:

diego.rafael.cardenas@ericsson.com

1 Administration, Control & Responsibilities

1.1 Purpose

The purpose of this document is to detail the items to be covered for the operation of the DJI Phantom Vision 2+ Small Unmanned Aircraft System (sUAS) by Ericsson Caribbean Inc. personnel.

1.2 Scope

This operations manual applies to all personnel involved with the operation of the DJI Phantom Vision 2+.

By law, any aircraft operation in the national airspace requires a certificated and registered aircraft, a licensed pilot, and operational approval. Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA) grants the Secretary of Transportation the authority to determine whether an airworthiness certificate is required for a UAS to operate safely in the National Airspace System (NAS). A Small Unmanned Aircraft System [sUAS] is defined by the Federal Aviation Administration [FAA] A UAS is the unmanned aircraft (UA) and all of the associated support equipment, control station, data links, telemetry, communications and navigation equipment, etc., necessary to operate the unmanned aircraft.

The UA is the flying portion of the system, flown by a pilot via a ground control system, or autonomously through use of an on-board computer, communication links and any additional equipment that is necessary for the UA to operate safely. The FAA issues an experimental airworthiness certificate for the entire system, not just the flying portion of the system.

This authority is being leveraged to grant case-by-case authorization for certain unmanned aircraft to perform commercial operations prior to the finalization of the Small UAS Rule, which will be the primary method for authorizing small UAS operations once it is complete.

The Section 333 Exemption process provides operators who wish to pursue safe and legal entry into the NAS a competitive advantage in the UAS marketplace, thus discouraging illegal operations and improving safety. It is anticipated that this activity will result in significant economic benefits, and the FAA Administrator has identified this as a high priority project to address demand for civil operation of UAS for commercial purposes.

1.3 Definitions and Abbreviations

ATZ	Aerodrome Traffic Zone
CFR	Code of Federal Regulations
GHz	Gigahertz
FAA	Federal Aviation Administration
MTOM	Maximum Take-off Mass

NTSB	National Transport Safety Board
OSD	On-Screen Display
RC	Radio Control
RTH	Return to Home
sUAS	Small Unmanned Aircraft System
VLOS	Visual Line of Sight

1.4 Document Control and Amendment Process

When any updates are necessary to Ericsson Caribbean Inc. sUAS Operations Manual, such as the adding of new aircraft, crew or sUAS operational uses, an amended Operations Manual will be sent to the Federal Aviation Administration for approval and the amendment noted in the amendments table.

1.5 Referenced Documents

1. Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA)
2. Notice of proposed rulemaking (NPRM), Federal Register / Vol. 80, No. 35 / Monday, February 23, 2015 / Proposed Rules: Operation and Certification of Small Unmanned Aircraft Systems. 14 CFR Parts 21, 43, 45, 47, 61, 91, 101, 107, and 183

1.6 Organization

Ericsson is the driving force behind the Networked Society – a world leader in communications technology and services. Our long-term relationships with every major telecom operator in the world allow people, businesses and societies to fulfil their potential and create a more sustainable future.

Our services, software and infrastructure – especially in mobility, broadband and the cloud – are enabling the telecom industry and other sectors to do better business, increase efficiency, improve the user experience and capture new opportunities.

Ericsson Caribbean Inc. was founded 1999 (company registration number 106645) with office address; City View Plaza, 48 Carr 165 Suite 6010, Guaynabo PR 00968, Puerto Rico, USA. Ericsson Caribbean Inc. has 100 employees providing services to the entire America continent.

Parent company Telefonaktiebolaget LM Ericsson (company registration number 556016-0680) was founded 1876 and with global headquarter in Stockholm, Sweden.

Total Number of employees worldwide 118,055, whereof 15,516 in North America and 11,066 in Latin America

Forty percent of the world's mobile traffic is carried over Ericsson networks.

2 Crew Composition, Qualification & Health requirements

2.1 Flight Team Composition

Normal operations: sUAS Pilot.

More demanding operations may require a payload operator or additional crew.

2.2 Qualification Requirements

All personnel operating Ericsson Caribbean Inc. sUAS must have undertaken the following:

- FAA approved ground training
- FAA approved flight demonstration

2.3 Lone Working

All personnel operating Ericsson Caribbean Inc. sUAS must adhere to the following:

- Group Directive, 034 02-3132 Uen, Occupational Health and Safety

2.4 Crew Health

All personnel operating Ericsson Caribbean Inc. sUAS must have a level of medical fitness equivalent of those required for a Private Pilot's License; however no formal certification is needed at this point.

2.5 Operation of Multiple types of sUAS

Upon the introduction of a new variety of sUAS the Ericsson Caribbean Inc. sUAS Operator must familiarize themselves with the Operating procedures for that sUAS.

2.6 Supervision of sUAS Operations

All operations must comply within the Ericsson Group Management System.

Those instructing the sUAS Operations must ensure that the sUAS Operators comply with FAA Regulations & Ericsson sUAS Operations Manual.

2.7 Logs and Records

On each operation, specific logs of the following will be recorded:

- Onsite weather conditions
- Battery voltage before and after each flight
- Pilot hours
- Aircraft hours
- Any incident small enough not to warrant Mandatory Occurrence Reporting
- Lone Working

2.8 Useful Android Applications

DJI Phantom Flight Helper

For DJI Phantom Quadcopter Users

Led light explanations

Pre-flight Checks

Setup Wizard

Software Installation

FAQ

Phantom Forum

DJI Dealers

DJI Spare Parts

Pro Version

Also for non-Phantom Vision 2 + sUAS

Flightlog - Pilot's Logbook

Specific logs are attached and featured in Appendix C of this manual.

http://www.staysafeapp.com/

For use when Lone Working

3 Operational Procedures

3.1 Types of Operations

The majority of Ericsson Caribbean Inc. sUAS operations will entail aerial photography and videography for the following:

- Line Of Sight (LOS) Surveys
- Site Feasibility Studies (Site Acquisition surveys)
- Site Physical Installation Audits
- QASIS (Quality Audits on Installations)
- Health & Safety inspection and audits
- Trouble shooting and inspection of corrective works
- Drive test/signal test horizontally and vertically
- Thermal inspection of antennas, active elements and cabling
- Customer acceptance inspection

Ericsson Caribbean Inc. reserves the right to explore new operational uses within the confines of the FAA regulations & the guidelines highlighted within this manual.

3.2 Operating limitations and conditions

Aircraft Type	**DJI Phantom Vision 2 +**
Operational Ceiling	2624ft amsl
Operational Endurance	25 mins
Maximum Speed	49ft/s amsl
Maximum OAT	+40C
Minimum OAT	-0C
Maximum Wind speed for operation	20kts

4 Flight Planning and Preparation

4.1 Determination of intended task and feasibility

Before the commencement of any operation, Ericsson Caribbean Inc. sUAS Operator will evaluate the proposed task, ensure that the operation is possible within the bounds of safety, regulation and practicality, and if the desired outcome is achievable for the activity. If the operation falls outside these bounds and cannot be modified to comply, it will not be undertaken.

4.2 Operating Site Location and assessment

- Before the commencement of any operation, Ericsson Caribbean Inc. sUAS Operator will research the proposed locations suitability for sUAS operations.
- This may include:
- Aeronautical map information to check the proximity of the proposed site to airfields, the airspace the location falls inside and any Notice to Airmen (NOTAM) which may affect the operation.
- Proximity to obstacles such as structures, buildings & bridges.
- Proximity to any source of radio interference such as high intensity radio masts, power lines.
- Proximity to residential housing and populace.
- The topography of the area.
- Retrieving information and contact details on local Police Office Stations, hospitals and fire brigade in the event of an emergency.

4.3 Risk Management

A risk assessment matrix (Appendix D) shall be used to help evaluate the potential risks of a particular operation and highlight the areas where safety gains may be made. If not enough can be done to mitigate the highlighted risks and the calculated value considered too high, the operation will be cancelled.

4.4 Pre-notification

Should the site fall within a congested area, controlled airspace of within 5NM/ 8KM of an aerodrome boundary, contact will be made with the FAA and controlling authority requesting permission for the operation. The operation will only take place after written permission has been achieved. If applicable, local Police Office may also be notified.

4.5 Site Permissions

Permission must be obtained from those within 50m of take-off & landing.

Additional permission from site providers or agents must be sought in accordance with site access requirements & agreements.

4.6 Weather

The sUAS Operator must familiarize themselves with the long range weather forecasts for the area. This will inform the Operator of the conditions likely to be faced at the site and any precautions which should be taken. In the event of weather conditions that fall outside of the operational envelope of the aircraft, the operation will be cancelled or postponed. Onsite weather checks will also be carried out by the sUAS Operator.

4.7 Preparation and serviceability of equipment and sUAS

Before an operation, a pre-flight check will also be made of the aircraft as shown in the pre-flight checklist in Appendix B.

If any maintenance or repair works have been carried out on the aircraft, a flight test will be carried out to prove serviceability and safety. The sUAS will be serviced by an approved competent person annually, and replaced after 10,000 flight hours.

4.8 Software Upgrades and Calibration

During Preparation the sUAS Operator is to conduct a check for SW upgrades and Calibration of the GPS system on board the aircraft. This requires periodic checks for software updates. The application required - DJI Phantom 2 - Naza-M Assistant Software v2.20

4.9 Charging and fitting Batteries

Lithium Polymer batteries are used to power Ericsson Caribbean Inc. sUAS. An undesirable by-product of these batteries is the ability to self-combust. Caution must be used in the care and management of the flight packs. Flight batteries may be charged using chargers approved by the sUAS Manufacturer specifications & in accordance with Manufacturer guidelines. Flight packs will have their cell voltages recorded before and after charging in the battery log. (See Appendix C)

Real time monitoring of flight pack voltage will be available to the pilot on an on screen display via live telemetry.

5 On Site Procedures

5.1 Site Survey

Ericsson Caribbean Inc. sUAS Operator will carry out the onsite survey to check that the site is as expected from the research on the intended location. Any variations on this information will be evaluated to ensure continued safety and suitability of the operation.

5.2 Selection of operating areas and alternatives

Onsite, a suitable take-off and landing site will be chosen that fits the requirements of the operation. A second landing site may also be chosen if there is the possibility of the first being compromised.

5.3 Crew Briefing

Before the operation commences the crew must be briefed on the following:

- The purpose of the operation
- Applicable airspace considerations
- Individual's responsibilities
- Relevant safety information
- Emergency procedures

5.4 Controlled Access Measures

Having paced the area in which the Operation will take place the sUAS Operator should identify landmarks on the periphery of the operation so as to provide a reference for the restricted area.

In each case the sUAS Operator should consider whether it is appropriate to place restrictions [cordon off] the take-off and landing area in order to keep third parties safe from sUAS operations.

5.5 Communications

Ericsson Caribbean Inc. sUAS Operator should ensure they have full concentration on the Operation & to consider the risk of external distractions as part of the Operation Risk assessment. If operating as a lone worker, the sUAS Operator is prohibited from using other communications devices, non-essential to the Operation.

Ericsson Caribbean Inc. sUAS operations crew may communicate using two way radio headsets. This will ensure that difficult communication due to outside noise or distance between the crew will not compromise the safety or efficiency of the operation. If applicable the payload operator will have an ear free in order to listen to 3rd Party input, or outside warnings. The pilot will receive any safety warnings or 3rd Party input via the payload operator. This ensures no disturbance to the pilot's concentration from unwanted sources and only essential information is relayed. The pre-flight briefing will cover the eventuality of crew communications failure and the procedures to be taken. These communications devices will not operate on a conflicting frequency to any flight operations equipment and Ericsson Caribbean Inc. sUAS Operators will hold any radio license (if required) to operate them.

5.6 Weather Checks

Forecasts will be updated before all flights & captured in the Risk Assessment. Wind speed will be measured using handheld anemometer prior to take off & recorded in the flight log checklist.

5.7 Loading of equipment

All payloads must be operated within the range limitations set down in the manufacturer's manual. However, payloads on the Ericsson Caribbean Inc. sUAS cannot be altered. The Phantom Vision 2+ has an integrated Camera/Gimbal Unit that is not modular. Correct function will be assessed onsite before attempting the operations.

6 FLIGHT PROCEDURES

Checklists are employed to ensure all equipment needed is present, that the sUAS to be flown is in an airworthy condition and that steps are taken in the correct sequence and without omission. In cases where are two party crew are onsite both personnel should be involved in checklist completion, and if this is the case, a 'challenge-response' method will be utilized.

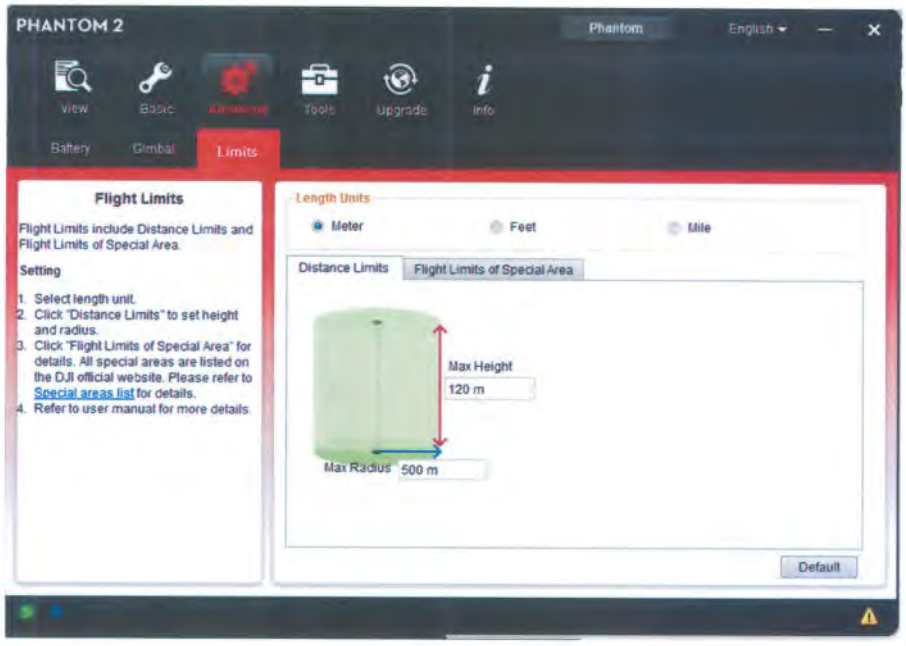
6.1 Pre-embarkation

A pre-embarkation checklist ensures all equipment needed to safely complete an operation is present.

6.2 Pre-flight

The pre-flight checklist runs through the procedure used to inspect the aircraft and payload to ensure its airworthiness. This also includes a last-minute voltage check of the flight batteries to ensure sufficient charge. The sUAS Operator should take time to assess the area in which the Operation will commence. This includes pacing the local & identifying the primary & a secondary landing area (as per Checklist).

The Ericsson Caribbean Inc. sUAS flight limits are configured within per FAA regulations.



6.3 Start-up

The start-up checklist runs through the power-up procedures of all flight operation equipment to the take-off phase of flight. sUAS modes will be confirmed through LED & on-screen display indications (OSD). The pilot will announce 'Rotors On' before application of power.

6.4 Take-off

When the sUAS Operator is ready for take-off, after a last scan to ensure no hazards exist, the pilot will start the timer and announce 'taking off' before starting the engines. The aircraft will then lift-off to a height of around 4-6ft off the ground to clear the ground effect of its propellers. A flight controls check is then performed to satisfy the pilot that the aircraft responds as it should to his control input before departing to start the task.

6.5 In flight

The sUAS Operator's primary concern whilst airborne is the safety of personnel and other airspace users.

The sUAS Operator will:

- Ensure that all regulations are adhered to.
- Monitor elapsed flight-time and ensure to land before the estimated time for battery depletion as well as monitoring LED/ OSD indications for low power.
- Fly the sUAS with anticipation of potential failures at all times and will ensure Failsafe and Return-to-home (RTH) features are armed at all times.
- Sacrifice the craft over the safety of personnel and property.
- Landing
- After returning from the operation, the pilot will scan the landing site for hazards. Once satisfied, the pilot will call 'Landing' before lowering the aircraft to the ground.

6.6 Shut-down

When the sUAS has come to a rest after landing, the shut-down checklist will be completed. Upon shutdown of the rotors the pilot will call 'rotors off' and will never apply further power without briefing the crew. Subsequent actions will include unplugging the aircrafts flight batteries first to make the aircraft safe and then on to the shut-down of radio links, video uplinks and the payload. Other than the safety aspect of unplugging the flight packs, the main aim of the shut-down checklist is to ensure that no equipment is left on.

Specific checklists are attached and featured in Appendix B of this manual.

7 Absolute Rules

Regardless of whether segregated airspace has been granted or not, LM Ericsson IAA Permission for Aerial Work and Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA) and the Notice of proposed rulemaking (NPRM), Federal Register / Vol. 80, No. 35 / Monday, February 23, 2015 / Proposed Rules: Operation and Certification of Small Unmanned Aircraft Systems. 14 CFR Parts 21, 43, 45, 47, 61, 91, 101, 107, and 183, the following absolute rules must be adhered to:

- sUAS shall not be operated beyond Visual Line of Sight (VLOS) and not further than 500 meters from the point of operation. Operators may work with a visual observer, but the operator still must be able to maintain visual line of sight
- sUAS shall not be operated at a height of more than 400 feet (120 meters) above ground level and no faster than 100 mph
- Flights must take place during daylight hours
- The operator must assess weather conditions, airspace restrictions and the location of people to lessen risks if he or she loses control of the sUAS
- sUAS shall not be operated over or within the confines of a congested area except with the written permission of the Authority
- sUAS shall not be operated over any assembly of persons on the ground nor closer than 150 meters laterally from such an assembly
- sUAS shall not be operated within 150 meters of any person, vessel, vehicle or structure not under the control of the sUAS operator; during take-off or landing however, the aircraft must not be flown within 50 meters of any person, unless that person is under the control of the sUAS operator.
- sUAS shall not be operated within an aerodrome traffic zone or closer than 8 kilometers (5 nautical miles) from an aerodrome boundary, whichever is the greatest distance, except with the written permission of the Air Controlling Authority.
- sUAS shall not be operated closer than 2 kilometers from an aircraft in flight. The operator must always see and avoid manned aircraft. If there is a risk of collision, the drone operator must be the first to maneuver away
- sUAS must stay out of airport flight paths and restricted airspace areas, and obey any FAA Temporary Flight Restrictions (TFRs)
- sUAS shall not be operated unless there is in place a third party liability insurance policy covering the operation of the system which is acceptable to the Authority
- The drone must be registered and aircraft markings are required
- Operators must be 17 years old, pass an aeronautical knowledge test, hold an FAA UAS operator certificate, and pass a TSA background check.
- Aeronautical knowledge testing must be renewed every 24 months (no private pilot license or medical rating would be required)

- Operators must ensure their aircraft is safe for flight, but there are no airworthiness standards or certification requirements (a preflight inspection conducted by the operator, checking communications links and equipment is sufficient)

- Operators must report an accident to the FAA within 10 days of any operation that results in injury or property damage

- No operations are allowed in Class A (18,000 feet & above) airspace. Operations in Class B, C, D and E airspace are allowed with the required ATC permission, Operations in Class G airspace are allowed without ATC permission

- The proposed rule maintains the existing prohibition against operating in a careless or reckless manner. It also would bar an operator from allowing any object to be dropped from the UAS

- The operator must discontinue the flight when continuing would pose a hazard to other aircraft, people or property

8 EMERGENCY PROCEDURES

8.1 Loss of power to engine

Motor failures may cause the sUAS to enter an uncontrolled descent. Multi-rotor aircraft have no gliding capability and this kind of failure will certainly result in a crash. A loud warning will be called by the sUAS Operator to anyone near to make them aware of the situation and potential danger.

8.2 Aircraft Battery Failure

This is the same as total motor failure on single battery aircraft. The aircraft will quickly descend to the ground, uncontrollably with no power. Should the battery fail, the aircraft will descend uncontrolled, and a loud warning will be called to help those around to avoid the danger.

8.3 Transmitter Battery Failure

The Ericsson Caribbean Inc. Puerto Rico sUAS are equipped with an integrated Failsafe System. This system is set up to "fail safe" in the event of loss of control link to the aircraft which is what will happen in this event. Failsafe mode will give control to the flight controller which will climb the aircraft to 60m altitude if below that height, or stay at its present height, if above 60m. The aircraft will then return on this altitude above its departure point and wait for 30 seconds to see if it can re-establish the control link. Should this not be possible, the aircraft will auto-land at its departure point and shut-down its motors, the shut-down checklist will then be read by the sUAS Operator. The designated sUAS Operator will ensure this mode is armed before flight.

8.4 Loss of Control Frequency

Having been pre-configured as part of the pre-flight checklist failsafe parameters, the aircraft will be programmed to enter Autoland/ RTH mode. In the event of an Autoland/ RTH the shut-down checklist will be read and the aircraft made safe. Investigations will then be made into the failure of the control frequency and the Incident Report will be completed. No further flights will take place at that site until a cause and resolution has been found.

8.5 Malicious or accidental interference with control frequency

If the source of the interference cannot be found and stopped, the operation will be cancelled.

8.6 Pilot Incapacitation

Should the sUAS become incapacitated for any reason the sUAS will activate the return-to-home function once the battery reaches a pre-configured warning level. Return-to-home mode will give control to the flight controller which will climb the aircraft to a predetermined altitude (usually set to 60m) if below that height, or stay at its present height, if above 60m. The aircraft will then return to overhead its departure point and wait for 30 seconds for further instruction. If none are received, the aircraft will auto-land at its departure point and shut-down it's motors. The aircraft will be made safe and appropriate help given to the pilot.

8.7 Fly Away Action

Fly Away's are uncontrolled aircraft flight where no control input from the pilot has any effect. A Fly Away is very unlikely but still may occur. If the aircraft does not encounter any obstacles, the auto-land feature is likely to be activated when the battery is depleted and the aircraft will attempt to land wherever it is. The other possibility is a collision with an obstacle or the ground. Should a fly-away occur, the sUAS Operator will note the speed and flight direction of the aircraft and inform local Air Traffic Control, if applicable, and the local Police Office. A reasonable estimation could be made about the potential range of a fly-away from the battery duration remaining and the aircrafts speed. Before flight, the sUAS Operator will ensure that the main controller is programmed to limit flight to 500m range and 400ft altitude. This may limit the range the sUAS will travel.

8.8 Battery fire

LiPo batteries in their initial stages (10-15secs) are almost impossible to extinguish. The sUAS Operator must have a fire extinguisher on hand to extinguish any secondary fires which may occur. All fires will be reported with an Incident Report and to the relevant authorities

DJI Smart Flight Battery Safety Guidelines to be adhered

9 AIRCRAFT OPERATION

9.1 Technical Description

9.1.1 Designation and Type

DJI Phantom Vision 2 +

Model No. – PV331

Serial No. – PH645475998 V3.0 CE

9.2 Aircraft Specifications

Aircraft	Supported Battery	DJI 5200mAh LiPo Battery
	Weight (Battery & Propellers Included)	1242g
	Hover Accuracy (Ready To Fly)	Vertical: 0.8m; Horizontal: 2.5m
	Max Yaw Angular Velocity	200°/s
	Max Tiltable Angle	35°
	Max Ascent / Descent Speed	Ascent: 6m/s; Descent: 2m/s
	Max Flight Speed	15m/s (Not Recommended)
	Diagonal Motor-Motor Distance	350mm
Gimbal	Working Current	Static : 750mA; Dynamic : 900mA
	Control Accuracy	±0.03°
	Controllable Range	Pitch : -90°—0°
	Maximum Angular Speed	Pitch : 90°/s
Camera	Operating Environment Temperature	0℃-40℃
	Sensor Size	1/2.3"
	Effective Pixels	14 Megapixels
	Resolution	4384×3288
	HD Recording	1080p30 & 720p
	Recording FOV	110° / 85°
Remote Control	Operating Frequency	5.728 GHz—5.85 GHz
	Communication Distance (Open Area)	CE Compliance: 400m; FCC Compliance: 800m
	Receiver Sensitivity (1%PER)	-93dBm
	Transmitter Power	CE Compliance: 25mW; FCC Compliance: 100mW
	Working Voltage	120 mA@3.7V
	Built-In LiPo Battery Working Current/Capacity	3.7V, 2000mAh
Range Extender	Operating Frequency	2412-2462MHz
	Communication Distance (Open Area)	500-700m
	Transmitter Power	20dBm
	Power Consumption	2W
DJI VISION App	System Requirement Of Mobile Device	iOS version 6.1 or above/ Android system version 4.0 or above
	Mobile Device Support	iOS recommended: iPhone 4s, iPhone 5, iPhone 5s, iPhone 6, iPhone 6 Plus, iPod touch 5 Android recommended: Samsung Galaxy S3, S4, Note 2, Note 3 or phones of similar configuration

9.3 Accident Prevention and Flight Safety Programme

Safety is paramount to Ericsson Caribbean Inc. A constant learning process is employed where incidents are noted including their context, in order to prevent repeats. Depending on the seriousness of the incident, it may be just recorded in Ericsson Caribbean Inc. own incident log. This is for small occurrences, such as minor sUAS Operator errors that could have led to damage to Ericsson Caribbean Inc. equipment or compromise the quality of the service provided to customers. These minor incidents, however, would pose no risk of injury to people or damage to property. More serious events would need to be reported in the FAA's and National Transport Safety Board Accident/Incident Information Reporting Scheme. http://www.ntsb.gov/_layouts/ntsb.aviation/index.aspx

Examples of NTSB reportable occurrences would be:

- Loss of control/data link
- Navigation failures
- Any incident that injures a third party
- Battery damage or fire
- Mechanical failure of the motors

Information retrieved in this log will be implemented in checklists or flight safety briefings in the future to ensure a constant process of improvement.

10 APPENDIX A – PERMISSION FOR AERIAL WORK

Insert specific Permission in here once received from the FAA.

11 APPENDIX B

11.1 sUAS Checklist – DJI Phantom

Title: sUAS Checklist - DJI Phantom

Document Number: LMI-14:003329 Uen Revision: A

Prepared By: LMI/ROR/IDA Sean Fox

12 APPENDIX C

12.1 RECORDS AND LOGS

Title: sUAS Flight Records & Logs

Document Number: LMI-14:003328 Uen Revision: A

Prepared By: LMI/ROR/IDA Sean Fox

13 APPENDIX D

13.1 Risk Assessment

Title: Risk Assessment - Working with sUAS

Document Number: LMI-14:003327 Uen Revision: A

Prepared By: LMI/ROR/IDA Sean Fox