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

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

August 25, 2015

Exemption No. 12588
Regulatory Docket No. FAA–2015–0708

Mr. Dane B. Jaques
Counsel for Pacific Gas and Electric Company
McKenna Long & Aldridge LLP
1676 International Drive, Penthouse
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Dear Mr. Jaques:

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 letters dated March 17, 2014 and June 1, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Pacific Gas and Electric Company (hereinafter petitioner or operator) for an exemption. The exemption would allow the petitioner to operate an unmanned aircraft system (UAS) to conduct aerial surveys, inspections, and patrols of Pacific Gas and Electric Company facilities.

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 are the Aeryon SkyRanger, Aeryon Scott, Altavian Nova F6500, PJ UAS CarbonCore Cortex, and InspecTools X-8.

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, Pacific Gas and Electric Company is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a),

[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.

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.

Conditions and Limitations

In this grant of exemption, Pacific Gas and Electric Company 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 Aeryon SkyRanger, Aeryon Scott, Altavian Nova F6500, PJ UAS CarbonCore Cortex, and InspecTools X-8 when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

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

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

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

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

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

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents, the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS−80) may be contacted if questions arise regarding updates or revisions to the operating documents.

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

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

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

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

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

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

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

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

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

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

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

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

20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the

intended operation and to operate after that for at least 5 minutes or with the reserve power recommended by the manufacturer if greater.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Sincerely,

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

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March 17, 2014

U.S. Department of Transportation
Docket Management System
1200 New Jersey Ave., SE
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Re: Petition of Pacific Gas and Electric Company, for an Exemption Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012

To Whom it May Concern:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 ("Reform Act") and 14 C.F.R. Part 11, Pacific Gas and Electric Company (hereinafter "PG&E" or "Petitioner") hereby applies for an exemption from the Federal Aviation Regulations ("FARs") identified below, to allow commercial operation of small unmanned aerial vehicles (*i.e.*, "small unmanned aircraft" or "UAS") for the purpose of conducting aerial surveys, inspections and patrols of its power-generation, electric and natural gas transmissions/distribution, and related facilities.

This exemption is made based on information outlined in this Petition for Exemption, as well as the operational requirements set forth in PG&E's UAS Operations Manual (hereinafter "PG&E's Ops Manual"). PG&E submits this Ops Manual as a confidential document pursuant to 14 C.F.R. § 11.35(b), as the material contains confidential commercial and proprietary information that PG&E has not and will not share with others. Additionally, these documents contain operating conditions and procedures that are not generally available to the public and are protected from release under the Freedom of Information Act, 5 U.S.C. § 552 *et seq.*, and any other requirements established by the FAA pursuant to Section 333 of the Reform Act.

For your convenience, this Petition for Exemption is organized as follows:

I. Description of Petitioner
II. Description of Proposed Operation
- **A.** Inspection and Patrol of PG&E Facilities and Infrastructure
- **B.** Precision Aerial Surveys and Inspections
- **C.** Inventory Assets in PG&E Storage Yards

III. Relevant Statutory Authority
IV. PG&E's Proposed UAS Operations Meet the Requirements of Section 333 of the Reform Act
- **A.** Approval is Warranted Based on the UAS's Size, Weight, Speed, and Operational Capability
- **B.** Approval is Warranted Based on the Operational Restrictions Set Forth in the PG&E UAS Operations Manual

V. Regulations From Which Exemption is Requested
- **A.** 14 C.F.R. Part 21, Subpart H – Airworthiness Certificates and 14 C.F.R. § 91.203
- **B.** 14 C.F.R. Part 27 Airworthiness Standards: Normal Category Rotorcraft
- **C.** 14 C.F.R. § 91.7(a): Civil Aircraft Airworthiness
- **D.** 14 C.F.R. § 91.9(b)(2): Civil Aircraft Flight Manual in the Aircraft and 14 C.F.R. § 91.203(a) and (b): Carrying Civil Aircraft Certification and Registration
- **E.** 14 C.F.R. §§ 91.9(c), 45.23(b) and 45.27(a): Aircraft Marking and Identification Requirements
- **F.** 14 C.F.R. § 91.103: Preflight Action
- **G.** 14 C.F.R. § 91.109(a): Flight Instruction
- **H.** 14 C.F.R. § 91.119 (b) and (c): Minimum Safe Altitudes
- **I.** 14 C.F.R. § 91.121: Altimeter Settings
- **J.** 14 C.F.R. § 91.151(a): Fuel Requirements for Flight in VFR Conditions
- **K.** 14 C.F.R. § 91.405(a), 91.407(a)(1), 91.409(a)(1) & (2); 91.417(a) and (b): Maintenance Inspections
- **L.** 14 C.F.R. § 61.113: Private Pilot Privileges And Limitations

VI. Public Interest
VII. Privacy
VIII. Federal Register Summary
IV. Conclusion

I. DESCRIPTION OF PETITIONER

Since 1905, PG&E has operated as a public utility corporation furnishing electric and gas services today to over 16 million people in PG&E's northern and central California service territory. PG&E delivers energy to approximately 5.4 million electric and 4.3 million natural gas households and businesses 24 hours a day, making it one of the largest utility providers in the United States.

The PG&E service territory extends from far northern California in Eureka, to Bakersfield in the south, and from the Pacific Ocean in the west to the Sierra Nevada Mountains in the east. PG&E's service territory is vast, and includes environmental and culturally sensitive geography, and extremes of weather, population density and geology. These extremes present challenges to PG&E in the management and operation of its assets while maintaining the company's responsibilities to its employees, the public, and the California environment under PG&E's charter to provide safe, reliable, clean and affordable energy service. UAS vehicles will help PG&E lessen its impact on sensitive areas, increase public and employee safety, and lead to improved reliability and lower overall customer costs.

The acquisition, production, and delivery of energy involve both Electric and Gas Operations units. Electric Operations includes Energy Procurement and Power Generation: the acquisition and production of electric power and the management of extensive hydroelectric resources that include much of the state's principal water collection and storage facilities, and, Electric Transmission and Distribution: the transfer of that electricity to and among wholesale and retail electric customers. Gas Operations involves acquiring natural gas and transferring it to retail end-users, storage, generation assets, or to wholesale customers.

PG&E manages a diverse portfolio of Utility Owned Generation ("UOG") and contracted ("Non-UOG") generation that supply power to serve PG&E's electric load and Ancillary Service requirements and other power needs throughout California and the western United States. PG&E's current UOG mix consists of 109 hydro generators, two natural gas-fired combined cycle power plants , two nuclear generators, ten reciprocating engine generators, as well as two fuel cell sites, and 10 photovoltaic solar generator facilities, and hundreds of Non-UOG conventional and renewable generators and power contracts.

PG&E's hydro generation facilities are supported by over 400 miles of canals, flumes, penstocks and tunnels ("Conveyances") that move water to and between powerhouses from water storage facilities located throughout the 140,000 acres comprising PG&E's hydro lands. Many of these conveyance facilities are remotely located high in the Sierra Nevada Mountains, although others are rural, suburban, and within city limits throughout the foothills and mountains of Northern California. PG&E's Power Generation Safety, Asset Management, Compliance, and Operations and Maintenance organizations have key responsibilities in assuring the continued safe, reliable and affordable production of most of the electricity generated in Northern California. Inspections are performed on these electric power generation and appurtenant facilities and lands year-round using a combination of aerial, vehicular, and foot patrols. Many facilities are located in remote locations with terrain that is steep, slippery, or otherwise hazardous to access by personnel and equipment. Regardless, these facilities must be inspected despite challenges posed by accessibility-limiting factors such as ice, snow and rain.

PG&E's photovoltaic generation sites are prime candidates for close-in visual and infrared overflights that provide inspection efficiencies in identifying problematic solar panels, strings, or cells. Currently, such inspections must be performed by maintenance personnel walking tens of acres of solar panels. Aerial overflights will help pinpoint potential problem areas and help maintenance personnel focus their activities.

Electric Transmission and Distribution Operations operates and maintains approximately 136,000 miles of high voltage electric lines and of related facilities located throughout PG&E's service area. As with hydro facilities, transmission and distribution facilities are inspected year-round using a combination of air, vehicular, and foot patrols. These facilities often originate at power generation facilities and follow utility rights-of-way corridors from and through remote areas to local and regional load centers and through low to very high population density areas. Electric facilities have similar inspection challenges to those found with water conveyances in terms of accessibility and hazardous locations, but are also generally energized with high voltage electricity and are often a hundred or more feet above the ground.

Gas Operations manages PG&E's 6,750 miles of natural gas transmission pipelines and related facilities located throughout and beyond PG&E's service territory. These facilities originate at regional hubs and terminate either at generation or storage facilities, or at points of distribution interconnections. As with hydro and electric transmission, gas transmission facilities traverse the countryside and include both in-ground and above-ground assets such as valves, compressor stations and interconnections. This presents inspection-related challenges, again, similar to electric generation and transmission.

PG&E's Aviation Services department within its Transportation Services organization plays a critical role in meeting these safety initiatives. Among other things, PG&E currently conducts powerline and pipeline inspections and patrols using helicopters, as well as monitoring PG&E hydro-electric facilities, including snowpack surveys, flume and ditch patrols, as well as visual inspections of penstocks and inverted siphons. UAS vehicles will augment the current aerial inspection fleet.

PG&E initially intends to utilize still and video visible and infrared sensors on UAS vehicles to augment current inspection and patrol methods, and expects later to deploy LiDAR (Light Detection and Radar), leak detection, and other relevant sensors. UAS vehicles may also fulfill a role in PG&E's emergency preparedness and operations functions in the event of natural disaster or other emergency incidents, and in physical security monitoring of critical facilities.

PG&E will supplement its current asset inspection and assessment practices with UAS vehicles to reduce human, geologic, and asset-related hazards and safety risks, increase patrol frequency in difficult-to-reach locations that present substantial inspection-related hazards and safety risks, and will collect data using methods and sensors not presently available to current patrol methods, and with a proximity not available from other available aerial and terrestrial vehicles or foot patrols.

PG&E is dedicated to developing innovative safety initiatives that will allow it to meet all regulatory licensing requirements. Small UASs offer a safer, more affordable and more environmentally friendly way to perform certain utility infrastructure inspections and patrols and aerial surveys. Accordingly, PG&E seeks the following exemption to allow commercial use of small UASs as described in this Petition for Exemption.

In accordance with 14 C.F.R. § 11.81(a), PG&E provides the following information in support of its Petition for Exemption.

The contact information for Petitioner is as follows:

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II. DESCRIPTION OF PROPOSED OPERATION

A. Inspection and Patrol of PG&E Facilities and Infrastructure

PG&E intends to use small UAS weighing less than 55 pounds for the purpose of conducting inspections, surveys and patrols of power-generation, and electric and gas transmission/distribution facilities and associated lands and infrastructure that PG&E owns or controls, including:

- Electric Power Transmission/Distribution;
- Natural Gas pipelines;
- Electric power generation plants, and;
- Water storage and conveyances associated with hydroelectric generation facilities.

All UAS operations will occur under tightly controlled conditions on properties that are either owned, controlled or licensed by PG&E or on properties on which PG&E has easements or landowner written permission granting PG&E the right to conduct inspections. These properties are largely located in remote or rural areas of California, away from people or crowds. The proposed UAS operations will be conducted in accordance with the conditions and limitations of this Petition for Exemption and PG&E's Ops Manual. In addition, PG&E intends to use UASs to conduct initial and recurrent training of its Pilots and Visual Observers ("VOs"), as required by the PG&E Ops Manual. Lastly, PG&E intends to conduct functional test flights following UAS maintenance or replacement of flight critical components to ensure the aircraft is in a condition safe for operation. Both training and test flights will only occur in controlled and sterile environments as required by the PG&E Ops Manual.

B. Precision Aerial Surveys and Inspections

PG&E also intends to use UAS weighing less than 55 pounds for the purpose of conducting precision aerial surveys and inspections of land associated with PG&E's facilities and infrastructure. The purpose of these aerial surveys will be to collect valuable information by mapping the geography and terrain of land that is within close proximity to, and which could potentially impact PG&E's facilities and infrastructure. Like PG&E's facilities and infrastructure, this land is largely located in remote or rural areas of California, away from people or crowds. As required by PG&E's Ops Manual, aerial surveys will occur under tightly controlled condition and will be limited to properties that are either owned, controlled, or licensed by PG&E or on properties on which PG&E has easements or landowner written permission granting PG&E the right to conduct aerial surveys.

C. Inventory Assets in PG&E Storage Yards

PG&E also intends to use UAS weighing less than 55 pounds for the purpose of taking inventory of PG&E assets located on PG&E owned property across the storage yards. PG&E will use RFID tag detection as the tool for performing inventory assessments. As required by PG&E's Ops Manual, aerial inventory will occur under tightly controlled conditions and will be limited to PG&E owned property.

III. RELEVANT STATUTORY AUTHORITY

This Petition for Exemption is submitted pursuant to Section 333(a) through (c) of the FAA Modernization and Reform Act of 2012 ("Reform Act"). Congress has directed the FAA "to safely accelerate the integration of civil unmanned aircraft systems into the national airspace system." Pursuant to Section 333 of the Reform Act, the FAA Administrator is to permit unmanned aircraft systems to operate in the national airspace system ("NAS") where it is safe to do so, based on the following considerations:

- The UAS's size, weight, speed and operational capability;
- Operation of the UAS in close proximity to airports and populated areas; and
- Operation of the UAS within the Visual Line-Of-Sight ("VLOS") of the Pilot and VO.

Additionally, the FAA Administrator has general authority to grant exemptions from the agency's safety regulations and minimum standards when the Administrator decides a requested exemption is in the public interest. *See* 49 U.S.C. § 106(f) (defining the authority of the Administrator); 49 U.S.C. § 44701(f) (permitting exemptions from §§ 44701(a), (b) and §§ 44702 – 44716, *et seq.*). A party requesting an exemption must explain the reasons why the exemption: (1) would benefit the public as a whole, and (2) would not adversely affect safety (or how it would provide a level of safety at least equal to the existing rules). *See* 14 C.F.R. § 11.81 (petitions for exemption).

IV. PG&E'S PROPOSED UAS OPERATIONS MEET THE REQUIREMENTS OF SECTION 333 OF THE REFORM ACT

PG&E's proposed operations in this Petition for Exemption qualify for expedited approval pursuant to Section 333 of the Reform Act as each of the statutory criteria and relevant factors are satisfied[1].

A. Approval is Warranted Based on the UAS's Size, Weight, Speed, and Operational Capability

PG&E will employ UAS that meet the following characteristics to perform the operations described in this Petition for Exemption:

- The UAS will weigh less than 55 pounds, including energy source(s), equipment and payloads;
- The UAS will not be flown at a ground speed exceeding 20 mph;
- The UAS will not be flown at an altitude that exceeds 400 feet Above Ground Level ("AGL"), unless the height of a structure being inspected exceeds 400 feet AGL. Under such circumstances, flights will be limited to 50 feet above the highest point of the structure;
- All UAS flights will be flown in such a way that they can be safely terminated with a reserve battery power of 25 percent of the battery's maximum charge;
- Altitude information will be generated by equipment onboard the UAS as specified using GPS triangulation, digitally encoded barometric altimeter, radio altimeter, or any combination thereof. This information, along with other real-time flight data, including, ground speed, heading, direction, remaining battery life, and any applicable warnings will be transmitted to the Pilot via telemetric data feed, which downlinks from the UAS to a ground-based-on-screen display on the controller or ground control station.

[1] The FAA has issued a grant of exemption in circumstances similar in all material respects to those presented by PG&E in this Petition for Exemption, including: Chevron USA, Inc. (Exemption No. 11176), Commonwealth Edison Company (Exemption. No. 11185), Aetos Group, Inc. (Exemption No. 11209) and Sky-Futures USA, Inc. (Exemption No. 11208).

- The UAS will have failsafe system redundancies and independent functionality to ensure the overall safety and predictability of the system. If connection to the remote control or ground control station is lost, failsafe systems will permit the UAS to return to a predetermined location and safely land without injury or damage.

- The radio frequencies used for operations and control of the UAS will comply with the Federal Communications Commission ("FCC") or other appropriate government oversight agency requirements.

B. Approval is Warranted Based on the Operational Restrictions Set Forth in the PG&E UAS Operations Manual

Together, PG&E's Ops Manual and the Manufacturer's Manual[2] for the selected UAS will contain all of the procedures and limitations necessary to successfully perform the operations specified in this Petition for Exemption. To assist the FAA in making a safety assessment of PG&E's proposed operations, below is a summary of operational limitations and conditions which will ensure an equivalent or higher level of safety to operations conducted under current regulatory guidelines:

1. The UAS will weigh less than 55 pounds, fully loaded.

2. Flights will occur within the visual-line-of sight of the Pilot and Visual Observer.

3. Maximum total flight time for each operational flight will be limited to 25 percent reserve battery power remaining.

4. Flights will be operated at an altitude of no more than 400 feet AGL and will not be conducted within navigable controlled airspace without prior written authorization from the FAA.

5. Flights will be operated at a lateral distance of at least 500 feet from any persons, inhabited structures, vehicles or vessels that are not involved in the inspection unless permission has been received and appropriate waivers have been signed by the persons or property owners in advance.

6. Flights will be limited to a speed of 20 mph.

[2] The term "Manufacturer's Manual" includes all relevant manufacturer publications, including, but not limited to: operations and flight manuals, user guides, component maintenance manuals, pilot training manuals, service information letters and, safety/service bulletins.

7. The UAS will be operated and maintained in accordance with the requirements of the UAS Manufacturer's Manuals and PG&E's Ops Manual.

8. Prior to the operation, the flights will be fully preplanned and briefed, including, among other things, possible contingencies, emergency procedures, flight crewmember roles and responsibilities, and Air Traffic Control ("ATC") communication procedures.

9. PG&E will obtain an Air Traffic Organization ("ATO") issued Certificate of Waiver or Authorization, otherwise known as a COA, prior to conducting any operations under this grant of exemption. This COA will require PG&E to request a Notice to Airman ("NOTAM") with an appropriate ATC facility between 48 and 72 hours before the flight.

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

11. If the UAS loses communication with the Pilot, it will have the capability to return to the sterile area home launch location or a pre-determined safe abort location.

12. Contingency plans will be in place to safely terminate flight if there is a loss of communication between the Pilot and VO(s).

13. The UAS will have the capability to abort flight in the case of unpredicted obstacles or emergencies.

14. The Pilot of the UAS will have at least a Private Pilot Certificate and at least a current Class III Medical Certificate.

15. VO(s) will have a current Class III Medical Certificate.

16. All UAS operations will occur in daylight, under VFR conditions. IFR flights are prohibited and no flights will occur at night, or in adverse weather conditions.

17. The radio frequency spectrum used for operation and control of the UA will comply with FCC or other appropriate government oversight agency requirements.

V. REGULATIONS FROM WHICH EXEMPTION IS REQUESTED

The Federal Aviation Act expressly grants the FAA the authority to issue exemptions. This statutory authority, by its terms, includes exempting civil aircraft, as the term is defined

under § 40101 of the Act, including UASs, from its safety regulations and minimum standards when the Administrator decides a requested exemption is in the public interest.[3]

PG&E seeks an exemption from several interrelated provisions of 14 C.F.R. Parts 21, 45, 61 and 91 for purposes of conducting the requested operations using UAS. Listed below are: (1) the specific sections of 14 C.F.R. for which exemption is sought, and; (2) the operating procedures and safeguards that Petitioner has established which will ensure a level of safety better than or equal to the rules from which exemption is sought.[4]

A. 14 C.F.R. Part 21, Subpart H – Airworthiness Certificates and 14 C.F.R. § 91.203(a)(1)

The FAA has stated that no exemption is needed from this section if a finding is made under the Reform Act that the UAS selected provides an equivalent level of safety when compared to manned aircraft normally used for the same application. These criteria are met, and therefore no exemption is needed. *See, e.g., In the Matter of the Petition of Astraeus Aerial*, Grant of Exemption No. 11062 (Sep. 25, 2014), Docket No. 2014-0352, at 13-14, 22. If, however, the FAA determines that there are some characteristics of the UAS that fail to meet the requirements of the Reform Act, an exemption is requested.

Equivalent Level of Safety

The UASs that PG&E will use are safe when taking into account their size, weight, speed, and operational capability. As set forth in Section IV(B), *supra,* the UAS will weigh less than 55 pounds and will be flown at less than 20 mph in sterile environments and completely outside controlled airspace. Additionally, the UASs carry neither a pilot nor passengers, carry no explosive materials and/or flammable liquid fuels, and operate exclusively within the parameters stated in PG&E's Ops Manual.

Operations conducted under this exemption will be closely controlled and monitored by the operator and will be conducted in compliance with local public safety requirements, to provide security for the area of operation. PG&E will also provide the FAA with advance notice

[3] *See* 49 U.S.C. § 44701(f) (authorizing the grant of exemptions from requirements of regulations prescribed pursuant to Sections 44701(a) and (b) and Sections 44702 - 44716).

[4] *See* 14 C.F.R. § 11.81(e), which requires a petition for exemption to include:

> The reasons why granting the exemption would not adversely affect safety, or how the exemption would provide a level of safety at least equal to that provided by the rule from which you seek exemption.

of all operations via NOTAMs. In all cases, the UAS operated under the proposed conditions, will be at least as safe as, or safer than conventional rotorcraft operating with an airworthiness certificate without the restrictions and conditions of the proposed UAS operations.

Further, the UAS does not need a means to communicate with other aircraft or ATC, because those capabilities will be possessed by the Pilot and VO, who are not onboard the UAS. *See* Grant of Exemption, Docket FAA-2014-0352 at 13. In addition, the UAS will be operated at all times in VLOS and in VFR conditions. *Id.*

B. 14 C.F.R. Part 27 Airworthiness Standards: Normal Category Rotorcraft

Title 14 C.F.R. Part 27 sets forth the procedural requirements for airworthiness certification of normal category rotorcraft. To the extent the Petitioner's UAS would otherwise require certification under Part 27, Petitioner seeks an exemption from Part 27's airworthiness standards for the same reasons identified in the request for exemption from 14 C.F.R. Part 21, Subpart H, *supra*.

C. 14 C.F.R. § 91.7(a): Civil Aircraft Airworthiness

Inasmuch as there will be no airworthiness certificate issued for the UAS Petitioner intends to use, PG&E seeks an exemption from 14 C.F.R. § 91.7(a), which requires that a civil aircraft be in airworthy condition to be operated. The FAA has stated that no exemption is required for 14 C.F.R. § 91.7(a) to the extent that the requirements of Part 21 are waived or found inapplicable. *See* Grant of Exemption, Docket FAA-2014-0352 at 13-14, 22. Accordingly, Petitioner requests that the requirements for § 91.7(a) be treated in accordance with Section V(A), *supra.*

D. 14 C.F.R. § 91.9(b)(2): Civil Aircraft Flight Manual in the Aircraft and 14 C.F.R. § 91.203(a) and (b): Carrying Civil Aircraft Certification and Registration

Title 14 C.F.R. § 91.9(b)(2) and § 91.203(a) and (b) require the operator to carry airworthiness documents and other aircraft manuals onboard the aircraft. Pursuant to 14 C.F.R. § 91.9(b)(2):

> (b) No person may operate a U.S.-registered civil aircraft –
>
> …
>
> (2) For which an Airplane or Rotorcraft Flight Manual is 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.

Pursuant to 14 C.F.R. § 91.203(a) and (b):

> (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.

Given the small size and configuration of the UAS, it would be impossible to keep airworthiness documents and other aircraft manuals on board the UAS because there is simply no room and the UAS has no cabin or cockpit.

Equivalent Level of Safety

In an FAA Office of Chief Counsel's Opinion dated August 8, 2014, and prepared by Dean E. Griffith, Attorney, AGC-220, it was acknowledged that the intent of 14 C.F.R. 91.9(b) and 91.203(a) and (b) is met if the Pilot of the unmanned aircraft has access to the UAS flight manual, registration certificate, and other required documents from the ground control station from which he or she is operating the aircraft.[5] As this FAA Office of Chief Counsel Opinion clarifies, the intent of the rule is to ensure the Pilot has access to these key documents during flight. Therefore, an equivalent level of safety will be achieved by ensuring that the Pilot has access to the documents at the ground control station from which he or she is piloting the UAS.

E. 14 C.F.R. §§ 91.9(c), 45.23(b) and 45.27(a): Aircraft Marking and Identification Requirements

PG&E seeks an exemption from the aircraft marking and identification requirements contained in 14 C.F.R. §§ 91.9(c), 45.23(b) and 45.27(a).

- 14 C.F.R. § 91.9(c), Civil Aircraft Flight Manual, Marking and Placard requirements, provides that:

[5] Memorandum from Mark Bury, FAA Assistant Chief Counsel for International Law, Legislation and Regulation, to John Duncan, FAA Flight Standards Service (Aug. 8, 2014); *see also id*. at 16-18.

> No person may operate a U.S.-registered civil aircraft unless that aircraft is identified in accordance with Part 45 of this chapter.

- 14 C.F.R. § 45.23(b), Markings of the Aircraft, states:

> When marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted or light-sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "light-sport, "experimental," or "provisional," as applicable.

- 14 C.F.R. § 45.27(a), Rotorcraft, states:

> 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.

In a previous Grant of Exemption, the FAA determined that exemption from these requirements was warranted provided that the aircraft "have identification (N-Number) markings in accordance with 14 C.F.R Part 45, Subpart C if the markings are as large as practicable." FAA Docket No. FAA-2014-0352.

Equivalent Level of Safety

All UAS flown by PG&E will bear N-number markings that are as large as practicable in accordance with 14 C.F.R. Part 45, Subpart C.[6]

F. 14 C.F.R. § 91.103: Preflight Action

PG&E seeks an exemption from 14 C.F.R. § 91.103, which requires a Pilot to become familiar with specific information before each flight, including information contained in the FAA-approved Flight Manual on board the aircraft. While the Pilot will be familiar with all information necessary to safely conduct the flight, an exemption is requested to the extent that an FAA-approved Flight Manual is required.

[6] *See, e.g.*, FAA Docket No. FAA-2014-0352, at 14.

Equivalent Level of Safety

An equivalent level of safety will be provided by following PG&E's Ops Manual and the Manufacturer's Manual. The Pilot will perform a series of checklists designed to identify any defects or inoperable components in accordance with PG&E's Ops Manual, including checklists covering Pre-Flight, Launch, Landing, and Post-Flight procedures. The Pilot will also be required to review potential local hazards to flight operations, and to equipment, structures, vehicles or personnel, and to review weather, flight requirements, battery charge, and landing and takeoff distance and locations, UAS performance data, and contingency landing areas—before initiation of flight. PG&E's Ops Manual and the Manufacturer's Manuals (and any other relevant manufacturer publications) will be kept at the ground control station and will be accessible to the Pilot at all times while operating the UAS.

G. 14 C.F.R. § 91.109(a): Flight Instruction

PG&E seeks an exemption from 14 C.F.R. § 91.109(a), which provides that "[n]o 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." UASs and remotely piloted aircraft, by their design, do not have functional dual controls. Instead, flight control is accomplished through the use of a device that communicates with the UAS via radio communications. Accordingly, an exemption will be required for the flight instruction requirements of 14 C.F.R. § 91.109(a).

Equivalent Level of Safety

PG&E will evaluate the qualifications of its Pilots based on their experience with the UAS to be operated, which will be verified through testing, in lieu of formalized training. Given the size and speed of the UAS that PG&E intends to use, an equivalent level of safe training can still be performed without dual controls because no pilot or passengers are aboard the UAS, and as required by PG&E's Ops Manual, all persons will be a safe distance away in the event that the UAS experiences any difficulties during flight instruction. Moreover, as required by PG&E's Ops Manual, all Pilot and VO training and instruction will occur in a controlled and sterile environment on property owned and controlled by PG&E, and where access by unauthorized persons will be strictly prohibited. As a whole, the restrictions placed on flight instructions in PG&E's Ops Manual ensure a level of safety better than or equal to the rules from which exemption is sought.

H. 14 C.F.R. § 91.119 (b) and (c): Minimum Safe Altitudes

Given the nature of the proposed operations, PG&E will require an exemption from the minimum safe altitude requirements of 14 C.F.R. § 91.119 (b) and (c).[7] Section 91.119(c) prescribes the minimum safe altitudes under which aircraft may not operate, including 500 feet above the surface and away from any person, vessel, vehicle, or structure in non-congested areas.[8] Section 91.119(b) provides that an aircraft may not operate "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."

An exemption is required because the proposed UAS operations will normally need to occur below 400 feet AGL. In circumstances where the UAS is used to inspect a structure whose height exceeds 400 feet AGL, the UAS will not be operated more than 50 feet above the highest point on the structure. Additionally, due the nature of the proposed operations, the Pilot and/or VO(s) may need to be less than 500 feet away from the UAS.

Equivalent Level of Safety

Compared to flight operations with rotorcraft weighing far more than the maximum weight proposed herein, and given the lack of flammable fuel with the UASs, any risk associated with these operations is far less than those that presently exist with conventional manned aircraft. An equivalent level of safety will be achieved given the size, weight, and speed of the UASs, as well as the controlled and sterile location where the operations will occur. In order to avoid any risk to manned aircraft, flight operations will be restricted to 400 feet AGL or below, or when inspecting a structure whose height exceeds 400 feet AGL, within 50 feet above the highest point on that structure. As set forth in PG&E's Ops Manual, the UASs will be operated in a sterile area that is owned and/or controlled by PG&E. These conditions and limitations will ensure that the proposed UAS operations are performed in a manner that protects the safety of participants, non-participants, the UAS and other property. As a whole, these requirements ensure a level of safety better than or equal to the rules from which exemption is sought

[7] Relief from § 91.119(a) will not be necessary because Petitioner will be able to perform an emergency landing without undue hazard to persons or property on the ground in the event of a failure. *See e.g.*, Grant of Exemption No. 11157 to Slugwear, Inc., dba Likeonatree Aerial (FAA-2014-0534 at 15).

[8] *See* 14 C.F.R. § 91.119(c).

I. 14 C.F.R. § 91.121: Altimeter Settings

This petition seeks an exemption from 14 C.F.R. § 91.121, which requires a person operating an aircraft to maintain cruising altitude or flight level by reference to an altimeter that is set to the elevation of the departure airport or barometric pressure. An exemption is required to the extent that the UASs do not have a barometric altimeter, but rather a GPS altitude read out.

Equivalent Level of Safety

The FAA has stated that an equivalent level of safety to the requirements of 14 C.F.R. § 91.121 can be achieved in circumstances where: (1) the UASs will be operated at 400 feet AGL or below, (2) within VLOS, (3) where GPS based altitude information is relayed in real time to the operator at a ground-based on-screen display and, (4) where prior to each flight, a zero altitude initiation point is established for the Pilot to confirm accuracy of the onboard GPS.[9]

The UASs that PG&E uses for performing the proposed UAS operations will meet all these operational characteristics. Moreover, as required by PG&E's Ops Manual, the Pilot will be required to calibrate the UA's GPS compass prior to each flight operation. Like the Grant of Exemption to Astraeus Aerial, the UASs PG&E intends to use, and the safety mitigation procedures contained in PG&E's Ops Manual, both ensure that an equivalent level of safety will be achieved, and a grant of exemption to the requirements of § 191.121 is therefore appropriate.

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

PG&E requests an exemption from 14 C.F.R. § 91.151(a)'s fuel requirements for flight in VFR conditions. Section 91.151(a) states:

> (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.

The current state of technology in modern lithium-ion batteries used to power UAS do not have sufficient capacity to permit meaningful flight operations, while at the same time

[9] *See* Grant of Exemption to Astraeus Aerial, Docket No. FAA-2014-0352 at 21.

maintaining a 30 minute battery reserve. An exemption from the fuel requirements of 14 C.F.R. § 91.151(a) is therefore required.

Equivalent Level of Safety

The FAA has stated that an equivalent level of safety can be achieved by requiring that each UAS operation be completed within 30 minutes flight time or with 25 percent battery power remaining, whichever occurs first.[10] PG&E's Ops Manual includes a similar restriction which requires UAS flight operations to be terminated once the battery reserve reaches 25 percent of the battery's maximum charge.

The UASs that PG&E will use under this grant of exemption will include low battery warning system. The amount of battery reserve power remaining will be transmitted to the Pilot via telemetric data feed, which downlinks from the UAS to a ground-based-on-screen display. As required by PG&E's Ops Manual, the Pilot will promptly fly the UAS back to the home launch location or pre-determined abort location where the UAS may safely land, while still maintaining a minimum of 25 percent reserve battery power. PG&E submits that the procedures requiring our flights to be safely terminated once the batteries fall below 25 percent capacity, combined with the requirement that flights only be conducted within a secure, isolated area, using a UAS weighting less than 55 pounds, and within VLOS of the Pilot and VO(s), ensure that the proposed operation will provide an equivalent level of safety to that provided by the regulations from which exemption is sought.

K. 14 C.F.R. § 91.405(a), 91.407(a)(1), 91.409(a) (1) and (2) ; 91.417(a) and (b): Maintenance & Inspections

PG&E requests relief from the regulatory maintenance, alteration and inspection requirements contained in 14 C.F.R. § 91.405(a), 91.407(a)(1), 91.409(a) (1) & (2); 91.417(a) and (b). These regulations specify maintenance and inspection standards in reference to 14 C.F.R. Part 43. *See, e.g.,* 14 C.F.R. § 91.405(a) (stating that each owner or operator of an aircraft "[s]hall have the aircraft inspected as prescribed in subpart E of this part and shall between required inspections. . . have discrepancies repaired as prescribed in part 43 of this chapter"). An exemption from these regulations is needed because Part 43 and these sections only apply to aircraft with an airworthiness certificate, which the UAS to be operated under this grant of exemption will not have.

[10] *Id.*

Equivalent Level of Safety

An equivalent level of safety will be achieved because maintenance and inspections will be performed in accordance with the Manufacturer's Manual and any applicable manufacturer Safety or Service Bulletins. Further, as required by PG&E's Ops Manual, and in accordance with the Manufacturer's Manual, prior to each flight, the Pilot will conduct a pre-flight inspection of the UAS and all associated equipment to account for all discrepancies and/or inoperable components. Maintenance will be performed and verified to address any conditions potentially affecting safe operation of the UAS and no flights will occur unless, and until all flight critical components of the UAS have been found to be airworthy and in a condition safe for operation. A functional test flight will be conducted following the replacement of any flight-critical components. As required by PG&E's Ops Manual, the Pilot who conducts the functional test flight will make an entry in the UAS aircraft records of the flight.

PG&E's Ops Manual also includes requirements to follow the manufacturer's UAS aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements for the following applicable components: powertrain system (powerplant), propellers, avionics and control surfaces (including ailerons/elevons), structures & airframe, camera system, electrical systems (including batteries), ground control station, hazard accessories, and spare parts. Further, PG&E's Ops Manual also includes procedures to document and maintain a record of the UAS maintenance, preventative maintenance, alterations, status of replacement/overhaul component parts, and the total time in service of the UASs used under this grant of exemption. As a whole, the maintenance and inspection procedures required in PG&E's Ops Manual ensure that an equivalent or higher level of safety will be achieved.

L. 14 C.F.R. § 61.113: Private Pilot Privileges And Limitations

PG&E seeks exemption from 14 CFR § 61.113, which restricts private pilot certificate holders from flying aircraft for compensation or hire, and would also require a second class medical certificate. The purpose of Part 61 is to ensure that the skill and competency of any pilot matches the airspace in which the pilot will be operating, as well as requiring certifications if the private pilot is carrying passengers or cargo for hire. In this case, while the UASs will be operated as part of a commercial operation, it carries neither passengers nor cargo.

In the Grant of Exemption to Astraeus Aerial (FAA Docket No. FAA-2014-0352), the FAA determined that the unique characteristics of UAS operation outside of controlled airspace did not warrant the additional costs and restrictions attendant with requiring the pilot to have a commercial pilot certificate and Class II Medical Certificate.

The restrictions PG&E has placed on its UAS operations meet or exceed the restrictions similarly imposed on Astraeus Aerial in FAA Docket No. FAA-2014-0352. PG&E will only perform UAS operations in controlled and sterile areas away from persons and property not

involved in the operation. The UASs will be flown based on VLOS at 400 feet AGL or below.[11] Moreover, a NOTAM will be issued between 48 and 72 hours before the flight is to occur, and the flight will be conducted in coordination, as necessary, with the applicable.

Equivalent Level of Safety

In addition to these flight restrictions, PG&E will further ensure safe operation by requiring its Pilots to be thoroughly versed not only in airspace and communication requirements of Part 91 applicable to all aircraft, but also in the unique aspects of UAS flight. Petitioner's Pilots will be required to maintain an understanding of all normal, abnormal and emergency procedures of the UAS he or she is operating. Pilots will also be required to accumulate and log, in a manner consistent with 14 C.F.R. § 61.51(b), a minimum of 200 flight cycles and 25 hours of total time as a UAS rotorcraft pilot, and at least 10 hours piloting the UAS used to perform operations under this exemption. Petitioner's Pilots will also be required to log at least 3 takeoffs and landings of the UAS used to perform operations under this exemption. Pilot currency requirements in PG&E's Ops Manual also require the Pilot to have conducted at least 3 launch and recovery operations, and have accrued at least 5 hours of flight time with the UAS in the preceding 90 days to be considered current. The Pilot qualification, training, and currency requirements in PG&E's Ops Manual ensure that its Pilots are competent and proficient in the UAS they are operating. These procedures ensure that an equivalent or higher level of safety will be achieved.

VI. PUBLIC INTEREST

The public interest will be served by granting PG&E's Petition for Exemption. Congress has established a national policy that favors early integration of UAS into the NAS in controlled, safe working environments such as those proposed by PG&E. Granting this Petition for Exemption helps fulfill Congress' goal in passing Section 333(a) through (c) of the Reform Act, namely; the FAA Administrator's assessment of whether certain UAS may operate safely in the NAS before completion of the rulemaking required under Section 332 of the Reform Act.

The proposed UAS operations in this Petition for Exemption will also improve safety and reduce risk by alleviating the public's exposure to danger associated with current aerial survey and inspection methods, namely, full size helicopters. The public's interest is furthered by reducing human exposure to death or serious injury associated with manned aircraft performing these activities.

[11] In circumstances where a structure being inspected exceeds 400 feet AGL, the UAS will not be operated more than 50 feet above the highest point on the structure.

PG&E's UAS operations will additionally improve the safety of PG&E and contractor employees who currently must conduct ground-based inspections and patrols in inherently hazardous environmental, geologic, and structural conditions that can be readily observed using UAS. Hazards and safety risks, for example, include cliff-sides or dams that presently require lowering personnel on ropes to inspect, or flumes and dam faces and transmission towers or pipelines that require specialized training and equipment to access and inspect safely. These and other assets present substantial personnel fall- or exertion-risk as some include walking hundreds of feet of steep stairs in isolated remote locations to perform asset inspections and assessments. UAS vehicles will help mitigate these safety risks and improve data quality.

PG&E's UASs will be battery powered and create no emissions. In the unlikely event of an accident, there is no fuel to ignite and explode. Any impact of Petitioner's lightweight sUASs is, obviously, far less than a full size helicopter. The public's interest is furthered by minimizing the ecological impact of an accident on the remote and delicate habitat that PG&E's facilities pass through. The public's interest is also furthered by reducing human exposure to potentially harmful or hazardous emissions associated with manned aircraft.

Aerial surveys and inspections of utility power-generation, electric and natural gas transmission/distribution, and related facilities play a critical role in ensuring a safe, reliable, affordable, and environmentally sound supply of energy to the public. The public as a whole benefits from the safer and more cost-effective method of performing aerial surveys and inspections using small UAS.

VII. PRIVACY

All PG&E UAS operations performed under this grant of exemption will be conducted in accordance with applicable federal, state, or local laws regarding privacy. PG&E will not conduct flight operations over property that it does not own or control without the prior consent and knowledge of the land owner/controller. Moreover, PG&E will not capture or use images from neighboring properties within the vicinity of UAS flight operations.

VIII. FEDERAL REGISTER SUMMARY

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

Petitioner seeks an exemption from the following sections in Title 14 of the Code of Federal Regulations:

Part 21, Subpart H; Part 27; 45.23(b); 45.27(a); 61.113; 91.7(a); 91.9(b)(2); 91.9(c); 91.103; 91.109(a); 91.119 (b) and (c); 91.121; 91.151(a); 91.203 (a) & (b); 91.405(a); 91.407(a)(1); 91.409(a)(1) & (2); 91.417 (a) & (b).

The exemption will enhance safety by reducing risk to the general public and property owners from the substantial hazards associated with performing equivalent utility power-generation aerial surveys and inspections with conventional fixed-wing aircraft, rotorcraft, or other methods.

IV. CONCLUSION

PG&E's Petition for Exemption demonstrates the appropriate safeguards and criteria that Congress articulated in Section 333 of the Reform Act, including weight, speed, operating capabilities, proximity to airports and populated areas, operation within VLOS and national security concerns. The proposed UAS operations will benefit the public as a whole by reducing human exposure to death or serious injury associated with manned aircraft performing these activities. The public will also benefit from the reduced environmental impact achieved through use of Petitioner's UAS. In consideration of the foregoing, this Petition for Exemption provides the FAA with more than adequate justification to allow commercial operation of PG&E's small UASs for the purpose of inspecting, patrolling, and surveying its utility power-generation, electric and natural gas transmission/distribution facilities, infrastructure and associated land.

We thank you for your prompt consideration of our requested exemptions. Should you have any questions, or if you need any additional information to support the requested exemptions, please do not hesitate to contact the undersigned.

Very truly yours,

Dane B. Jaques
Mark E. McKinnon
Matthew J. Clark

Counsel for Petitioner

(The following attached items contain proprietary and commercial information exempt from disclosure under the Freedom of Information Act, 5 U.S.C. § 522 *et seq.*, and should be held in a separate file pursuant to 14 C.F.R. § 11.35(b)).

Attachments:

PG&E UAS Operations Manual