

# State Farm Insurance Companies®

ONE STATE FARM PLAZA  
BLOOMINGTON, ILLINOIS 61710-0001

JACK WEEKES, CPCU®, CLU®, ChFC®  
OPERATIONS VICE PRESIDENT

October 15, 2014

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

Re: Exemption Request Pursuant to Section 333 of the FMRA and Part 11 of the Federal Aviation Regulations, Seeking Exemption from 14 C.F.R. Part 21 Subpart H; 14 C.F.R. § 45.23(b); 14 C.F.R. § 45.27; 14 C.F.R. §§ 61.113(a) and (b); 14 C.F.R. § 91.119(c); 14 C.F.R. § 91.121; 14 C.F.R. § 91.151(a); 14 C.F.R. § 91.405(a); 14 C.F.R. § 91.407(a)(1); 14 C.F.R. §§ 91.409(a)(1) and (2); 14 C.F.R. §§ 91.417(a) and (b).

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA) and 14 C.F.R. Part 11, State Farm Mutual Automobile Insurance Company ("Petitioner" or "State Farm") hereby applies for an exemption from the listed Federal Aviation Regulations ("FARs") and any other necessary to allow its operation of small Unmanned Aircraft Systems ("UAS") to conduct roof inspections, so long as such operations are conducted within and under the conditions outlined herein. The requested exemption would permit the operation of the UAS to obtain up-close images of State Farm policyholders' roofs and perform an in-depth analysis of the images to determine the nature and extent of damage to the roof surface without placing claim adjusters at risk. The State Farm claim representative will be able to share promptly with the customer the report and inspection images and reduce claim payment time.

State Farm was founded in 1922 with the vision of operating fairly and doing the right thing for its customers. In advancing this vision and the goal of providing the best service possible, State Farm has committed to supporting innovation that improves the lives and safety of its policyholders and the general public. This commitment in championing innovation to improve lives and safety has helped State Farm become the nation's leading insurer of homes and automobiles, in addition to being an industry leader in other areas of insurance and financial services. Currently, State Farm has over 65,000 employees and 18,000 agents providing remarkable service in taking care of over 27 million home policies (1 in 5 U.S. houses) and 44 million auto policies. Whether providing assistance after a major natural disaster or looking for ways to help people manage everyday risks, State Farm is there. By exploring the ability to use UAS, State Farm has the opportunity to further champion innovation in order to benefit the well-being of its policyholders and the general public.

## I. REQUEST FOR EXEMPTION TO USE UAS FOR ROOF INSPECTIONS

### A. Overview of Request to Use UAS for Roof Inspections

State Farm proposes to conduct roof inspections using small UAS including the Aerialtronics Altura Zenith ATX8. As described more fully below, the requested exemption would permit the operation of small UAS under controlled conditions in airspace that is 1) limited, 2) predetermined, and 3) controlled as to access. Operations will be limited to the customer's property and always occur within the line of sight of the UAS operator. The property owner will be notified in advance of the date and time for inspection. The customer's privacy and their neighbors' privacy will be fully protected. State Farm's use of UAS for roof inspections does not create a hazard to users of the national airspace or the public or pose a threat to national security. In support of this exemption request, State Farm is submitting an Operations Manual and Training Syllabus under separate cover and with a request for confidential treatment.<sup>1</sup>

Grant of this request is warranted as use of UAS will improve safety for State Farm's claim representatives. Currently, claim representatives need to physically climb onto a policyholder's roof using ladders for inspection. Inspecting roofs is dangerous as evidenced by annual industrywide worker compensation claims. Each year, claim handlers throughout the industry are injured in falls while performing the task. By utilizing UAS, the claim handlers will be able to reduce their exposure to hazards and obtain accurate assessments of the roof while remaining safely on the ground.

### B. Public Interest Benefits of Permitting Use of UAS for Roof Inspections

Grant of State Farm's request to use UAS for roof inspections is in the public interest. While State Farm takes every precaution to keep its claim handlers safe, roof inspection conducted by human beings carries with it certain risks. Currently, State Farm claim handlers need to physically climb onto the roof using ladders and other safety gear to conduct inspections. Sometimes, a two story/steep team is used, requiring two claim handlers and special safety harnesses. The dangers of inspecting any roof include losing one's footing, having a ladder slip, and being blown off a roof from wind shear. A recent news article noted that fatalities rates among roofers are the highest in the construction trades.<sup>2</sup> In addition to safety concerns, inspecting a roof by physically climbing on it has the potential to damage the roof. Using UAS for roof inspections avoids all of these risks. By utilizing UAS, State Farm's claim handlers will be able to reduce their exposure to hazards and rapidly obtain accurate assessments of the roof while remaining safely on the ground. Faster roof damage assessments will result in faster claims processing and repairs for affected policy holders.

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<sup>1</sup> Petitioner submits its Operations Manual and Training Syllabus as Confidential documents under 14 C.F.R. § 11.35(b) as they contain proprietary information that Petitioner has not and will not share with others. The documents contain operating conditions and procedures that are not available to the public and are protected from release under the Freedom of Information Act, 5 U.S.C. § 552.

<sup>2</sup> Alexandra Berzon and Kris Hudson, *Fight Erupts Over Protecting Rooftop Workers*, Wall Street Journal, Sept. 28, 2014 available at <http://online.wsj.com/articles/builders-osh-square-off-on-rooftop-safety-1411947843>.

In addition, as described in more detail below, operation will not create a hazard to aviation or the public. Flights will be conducted under 200 feet AGL—avoiding interference with users of the national airspace system. Operation will also not create a hazard to the public as State Farm will only operate the UAS only over private property with the owner’s consent. In addition, the UAS will have a geo-fence around the owner’s property line to prevent the UAS from flying where it should not be. Finally, operation will not pose a threat to national security. The UAS poses no credible threat to national security due to its size, speed, of operation, location of operation, lack of explosive materials or flammable jet fuels, and inability to carry a substantial external load.

## **II. THE FAA’S LEGAL AUTHORITY TO GRANT THIS EXEMPTION REQUEST**

This exemption request will help the FAA to fulfill Congress’ goal in passing Section 333 of the FMRA. Section 333 directs the Secretary of Transportation to consider whether certain UAS may operate safely in the national airspace system (NAS) before completion of the rulemaking required under Section 332 of the FMRA. The Secretary is required to determine which types of UAS do not create a hazard to users of the NAS or the public or pose a threat to national security in light of the UAS’s size, weight, speed, and operational capability and whether operation will occur near airports or populated areas and within the visual line of sight of the operator.<sup>3</sup> The FMRA illustrates Congress’ intent to have the FAA issue exemptions and allow civil UAS, so long as they operate within the necessary safety parameters.

In addition, the Federal Aviation Act expressly grants the FAA the authority to issue exemptions. This statutory authority by its terms includes exempting civil aircraft, as the term is defined under § 40101 of the Act, that includes UAS, from the requirement that all civil aircraft must have a current airworthiness certificate. The Administrator may grant an exemption from a requirement of a regulation prescribed under §§ 44701(a) or (b) or in §§ 44702-44716 of the Act if the Administrator finds the exemption in the public interest.<sup>4</sup>

## **III. APPLICATION INFORMATION**

The name and address of the applicant is:

Todd Binion  
Innovation Manager  
State Farm Mutual Automobile Insurance Company  
3 State Farm Plaza South  
Bloomington, IL 61791  
todd.binion.hko0@statefarm.com  
309-735-8633

Regulations from which the exemption is requested:

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<sup>3</sup> FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, 126 Stat. 75-76 (codified as a Note to 49 U.S.C. § 40101).

<sup>4</sup> 49 U.S.C. § 44701(f). *See also* 49 U.S.C. § 44711(a); 49 U.S.C. § 44704; 14 C.F.R. § 91.203(a)(1).

14 C.F.R. Part 21 Subpart H;  
14 C.F.R. § 45.23(b);  
14 C.F.R. § 45.27;  
14 C.F.R. §§ 61.113(a) and (b);  
14 C.F.R. § 91.119(c);  
14 C.F.R. § 91.121;  
14 C.F.R. § 91.151(a);  
14 C.F.R. § 91.405(a);  
14 C.F.R. § 91.407(a)(1);  
14 C.F.R. §§ 91.409(a)(1) and (2);  
14 C.F.R. §§ 91.417(a) and (b).

#### **IV. THE AIRCRAFT**

State Farm specifically proposes to conduct UAS operations using small UAS including the Aerialtronics Altura Zenith ATX8. The Altura Zenith ATX8 is a multi-rotor aircraft built with a monocoque carbon airframe. The Zenith has a 5.6 kg take-off weight and a maximum payload of 2.9 kg. The Zenith carries a 16.600 mAh battery, which facilitates up to 45 minutes of flight-time with total payloads of up to 6.4 lbs. for the ATX8. It can be flown with either a radio or tablet and carries a variety of payloads. The Zenith has a maximum cruise speed of 20 m/s. It features auto-takeoff and landing, auto go home and landing, GPS waypoint navigation, direction lock, and GIS mapping. Specifications include:

- Length x Width : 23.6" x 23.6"
- Height : 13.7" – 21.6" tall
- Weight : 7.7 lbs., without payload (less than 15 lbs. with payload)

State Farm agrees that any UAS it uses for roof inspections will include, at minimum: geofencing at a maximum ceiling of 200' AGL, flight programming capabilities, a flight termination link available to the operator to prevent a "fly away," and safe abort procedures. If the UAS loses communications or its GPS signal, the UAS will return to a pre-determined location and land or be recovered in accordance with the Operations Manual. The UAS will have markings identifying the serial number and identification (N-number) markings as large as practicable. Further, State Farm's UAS operation will comply with all manufacturer Safety Bulletins. Any UAS to be used will weigh less than 55 pounds and would be specifically authorized by the FAA. UAS operations will occur only during daytime.

State Farm will incorporate Airware's flight control systems across the range of our vehicles. Airware's systems are designed to enable safe and reliable commercial UAS applications and have been built from the ground up by leading engineers from the aerospace industry utilizing industry best practices and decades of experience. The system has been developed using model-based-design for the core control algorithms and robust C/C++ at the application and OS level. The autopilot system is built on top of a real-time embedded operating system which has been certified to DO-178B. Airware uses rigorous design, development, review, and testing processes, using strict compiler checking, formal verification methods, MISRA compliance

verification, unit testing, and integration testing with test coverage verification. In addition to aerospace quality hardware and software, safety features include geofencing for ensuring vehicles stay within pre-defined areas, a full suite of contingency management functions, user and flight plan management and approval functionality, amongst others.

## V. OPERATING PARAMETERS

Petitioner 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 operations conducted with conventional aircraft. Further details about the aircraft and operating procedures are available in the Operations Manual and Training Syllabus.

The limitations and conditions to which State Farm agrees to be bound when conducting R&D for commercial operations under an FAA issued exemption include:

### A. UAS Pilot and Observer

1. UAS operations will be conducted by, at minimum, pilots holding a private pilot certificate and at least a current third-class medical certificate.
2. All UAS operations must utilize a visual observer (“VO”).
3. The pilot-in-command (“PIC”) and VO must be able to communicate verbally at all times.
4. The PIC will be wearing a safety vest that identifies him or her as the pilot.
5. Prior to operations, the pilot must have accumulated and logged a minimum of 200 flight cycles, or more as required by the FAA, and 25 hours of total time as a UAS rotorcraft pilot. The pilot must also have accumulated and logged prior to operations at least ten hours as a UAS pilot with a similar UAS type (single blade or multi-rotor). Prior documented flight experience that was obtained in compliance with applicable regulations may satisfy this requirement.
  - a. Training, proficiency, and experience-building flights can also be conducted under the FAA’s grant of exemption to accomplish the required flight cycles and flight time.
  - b. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the pilot must operate the UA with appropriate distance from nonparticipants in accordance with 14 C.F.R. § 91.119.

6. State Farm will rely on the UAS vendor(s) to provide a pilot qualification program, including a training program incorporating proper aircraft operations and safety standards.
  - a. Prior to any flight operations authorized by this grant of exemption, the PIC and VO must have successfully completed the vendor training program and qualification process and the State Farm training process, as outlined in the Operations Manual and Training Syllabus.
  - b. The qualification test will be developed and implemented by a qualified person designated at the sole discretion of State Farm.
  - c. A record of completion of this qualification process must be documented and made available to the Administrator upon request.
7. State Farm will require all pilots conducting UAS operations to provide proof of pilot and third-class medical certification as well as proof of completion of the applicable vendor's training program.

B. Operational Parameters

1. Aircraft will not carry pilots or passengers, and aircraft will not carry explosive materials or flammable liquid fuels.
2. UAS must be operated within visual line of sight of the pilot at all times.
3. UAS may not be flown at ground speeds exceeding 50 knots.
4. Flights will be operated at an altitude of no more than 200 feet above ground level.
5. Each UAS operation will be completed within 60 minutes flight time or with 25% battery power remaining, whichever occurs first. At 30% battery the UAS will enter a return and land sequence; at 20% it will land immediately.
6. UAS will not be operated over any person (other than participating State Farm personnel) at an altitude that is hazardous to persons or property on the surface in the event of a UAS failure or emergency.
  - a. Distance from participating persons will be specified in the Operations Manual.
  - b. Operations will be conducted as far as practicable from non-participating persons.
7. The UAS will abort the flight in the event of unpredicted obstacles or

emergencies in accordance with the Operations Manual.

8. Prior to operations, a flight demonstration, administered by an operator-approved and qualified pilot will be successfully completed and documented. Documentation will be made available for review by Administrator upon request.
9. The operator must obtain an Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA) prior to conducting any operations under this grant of exemption.
  - a. This COA will also require the operator to request a Notice to Airmen (NOTAM) not more than 72 hours in advance, but not less than 48 hours prior to the operation.
10. Operations will be limited to the property of consenting State Farm policyholders.
11. Petitioner will display signage notifying the public of UAS operations before beginning operations. Signs will be approximately 18" x 24" in size and will be placed in locations that will be visible from adjacent roadways at least 5 minutes prior to UAS operations. An area will be marked off as the UAS "landing zone." Petitioners will also display signage notifying the public that UAS operation is in progress once operations begin.
12. Before conducting operations, the radio frequency spectrum used for operation and control of the UAS will comply with the FCC or other appropriate government oversight agency requirements.
13. The UAS pilot will establish a working relationship with a representative at the local Flight Standards District Office ("FSDO") with which to periodically review safety procedures and other operations to further enhance safety. Under normal circumstances, the operator will submit a written Plan of Activities to the local FSDO at least 48 hours prior to conducting operations. In an emergency situation, the operator will submit a written Plan of Activities 24 hours prior to conducting operations, unless sooner authorized by the FSDO. The Plan of Activities will include:
  - a. Dates and times for all flights;
  - b. Name and phone number of the operator for the UAS and for the person responsible for on-site operations;
  - c. Make, model, and serial or N-number of UAS;
  - d. Name and certificate number of pilot(s);

- e. Signature of exemption holder or representative;
  - f. Description of flight activity, including maps/diagrams of area over which operations are occurring and essential altitudes.
14. The documents required under 14 C.F.R. § 91.9 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.
  15. The UAS must remain clear and yield the right of way to all other manned operations and activities at all times (including, but not limited to, ultralight vehicles, parachute activities, parasailing activities, hang gliders, etc.).
  16. State Farm will ensure safety to first responder aircraft and helicopter traffic. Upon notification from manned aircraft controllers or through visual identification of manned aircraft, State Farm will immediately suspend the UAS flight until the airspace is cleared.
  17. UAS operations may not be conducted during night, as defined in 14 C.F.R. § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.
  18. The UAS may not be operated by the PIC from any moving device or vehicle.
  19. The UAS 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.
  20. The UAS may not operate in Class B, C, or D airspace without approval from the FAA. The UAS may not operate within 5 nautical miles of the geographic center of a non-towered airport as denoted on a current FAA-published aeronautical chart unless an agreement with that airport's management is obtained, and the operation is conducted in accordance with a NOTAM as required by the Operator's COA. The letter of agreement with the airport management should be made available to the Administrator upon request.
  21. Altitude information will be provided to the UAS pilot via a digitally encoded telemetric data feed, which downlinks from the aircraft to a ground-based on-screen display. The UAS may have a GPS altitude readout. Prior to each flight, a zero altitude initiation point will be established and confirmed for accuracy by the PIC.
  22. Any incident, accident, or flight operation that transgresses the lateral or



vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS-80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: [www.nts.gov](http://www.nts.gov). Further flight operations may not be conducted until the incident, accident, or transgression is reviewed by AFS-80 and authorization to resume operations is provided.

C. Operations Manual

1. The Operator must follow the procedures as outlined in its Operations Manual.
2. The Operations Manual must be maintained and made available to the Administrator upon request.

D. Pre-Flight Inspections and Maintenance

1. Prior to each flight, pilot will inspect UAS to ensure it is in condition for safe flight. If the inspection reveals a discrepancy, aircraft will be prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.
2. All maintenance and alterations will be properly documented in the aircraft records.
3. Any UAS that undergoes maintenance or alterations that affect the UAS operation or flight characteristics will undergo a functional flight test in accordance with the Operations Manual.
4. Petitioner will institute a rigorous maintenance program to ensure airworthiness of UAS. Operator will follow the manufacturer's UAS aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements.
  - a. When unavailable, requirements must be established in the Operations Manual, including for the following:
    - i. Actuators / Servos;
    - ii. Transmission (single rotor);
    - iii. Powerplant (motors);
    - iv. Propellers;
    - v. Electronic speed controller;

- vi. Batteries;
  - vii. Mechanical dynamic components (single rotor);
  - viii. Remote command and control;
  - ix. Ground control station (if used); and
  - x. Any other components as determined by the operator.
- 5. Operator will develop 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 UAS. These procedures will be added to the Operations Manual.
  - 6. Operator will develop UAS technician qualification criteria. These criteria will be added to the Operations Manual.

## **VI. SPECIFIC SECTIONS OF 14 C.F.R. FROM WHICH PETITIONERS SEEK AN EXEMPTION**

State Farm requests exemption from the following Federal Aviation Regulations (“FARs”) to the extent necessary to enable the requested UAS operations for the reasons detailed below.

### **A. 14 C.F.R. Part 21 Subpart H Airworthiness Certificates**

Subpart H, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates. Given the size and limited operating area associated with the aircraft to be utilized, 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<sup>5</sup> and Section 333 of the FMRA 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 all cases, an analysis of these criteria demonstrates that the UAS operated without an airworthiness certificate, in the proposed environments and under the conditions proposed will be at least as safe, or safer, than a conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate without the restrictions and conditions proposed.

The Zenith UAS to be operated hereunder is less than 15 pounds including payload, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and will operate exclusively within the parameters stated in the Operations Manual. Unlike other civil aircraft, operations under this exemption will be tightly controlled and monitored by both the operator and under the requirements and in compliance with local public safety requirements, to provide security for the area of operation. The FAA will have advance notice of all operations via notices to airmen (NOTAMS). Finally, these UAS, as a result of their size, weight, speed,

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<sup>5</sup> 49 U.S.C. § 44701(f).

operational capability, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security.

B. 14 C.F.R. § 45.23(b) Display of marks; general; 14 C.F.R. § 45.27 Location of marks; non-fixed wing aircraft

Section 45.23(b) requires markings in letters not less than 2 inches nor more than 6 inches high the words such as “limited,” “restricted,” and “experimental,” as applicable. Section 45.27 requires that each operator of a rotorcraft must display on that rotorcraft horizontally on both surfaces of the cabin, fuselage, boom, or tail the marks required by § 45.23.

Given the size of the UAS, two-inch lettering will not be feasible. The UAS will also have no entrance to the cabin, cockpit, or pilot station on which the applicable words can be placed. An equivalent level of safety will be achieved by having any required words displayed on the aircraft, as applicable, in letters of legible size, in a location where the pilot, observer, and others working with the UAS will see the identification. The FAA has issued exemptions to § 45.23 in Exemptions Nos. 10700, 8738, 10167, 10167A, and 11062. The FAA issued an exemption to 45.27 in Exemption No. 8496B.

C. 14 C.F.R. §§ 61.113(a) and (b) Private pilot privileges and limitations

Sections 61.113 (a) and (b) limit private pilots to non-commercial operations. Because the UAS will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations by requiring the PIC operating the aircraft to have a private pilot’s license rather than a commercial pilot’s license to operate this small UAS. Unlike a conventional aircraft that carries the pilot and passengers, the UAS is remotely controlled with no living thing on board. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance as set forth in the Operations Manual. The level of safety provided by the requirements included in the Operations Manual exceeds that provided by a single individual holding a commercial pilot’s certificate operating a conventional aircraft. The risks associated with the operation of the UAS are so diminished from the level of risk associated with commercial operations contemplated by Part 61 when drafted, that allowing operations of the UAS as requested with a private pilot as the PIC exceeds the present level of safety achieved by 14 C.F.R. §§ 61.113 (a) and (b). The FAA issued an exemption to this regulation in Exemption No. 11062.

D. 14 C.F.R. § 91.119(c) Minimum safe altitudes over congested and other areas

Section 91.119(c) establishes safe altitudes for operation of civil aircraft over areas other than congested areas. State Farm requests relief from this section with respect to those participating persons, vehicles, and structures directly involved with R&D. The UAS will never operate at higher than 200 AGL. It will be operated in a restricted area, where buildings and people will not be exposed to operations without their pre-obtained consent. Relief from this provision is warranted as operations will be conducted with the safety provisions as outlined herein and in the Operations Manual. The FAA issued an exemption to this regulation in Exemption No. 11062.

E. 14 C.F.R. § 91.121 Altimeter Settings

This regulation requires each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "...to the elevation of the departure airport or an appropriate altimeter setting available before departure." As the UAS may not have a barometric altimeter, but instead a GPS altitude read out, an exemption may be needed. An equivalent level of safety will be achieved by the operator, pursuant to the Operations Manual, confirming the altitude of the launch site shown on the GPS altitude indicator before flight. The FAA issued an exemption to this regulation in Exemption No. 11062.

F. 14 C.F.R. § 91.151(a) Fuel requirements for flight in VFR conditions

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

Complying with the 30 minute reserve requirement in 14 C.F.R. § 91.151, would unnecessarily limit the length of State Farm's UAS flights. The battery powering the Zenith provides approximately 45 minutes of flight time. To meet the 30 minute reserve requirement in 14 C.F.R. § 91.151, UAS flights would be limited to approximately 15 minutes in length. Given the limitations on the UAS's proposed flight area and the location of its proposed operations within a predetermined area, a longer time frame for flight in daylight conditions is reasonable.

Operating the small UAS in a tightly controlled area where only personnel and property owners will be present does not engender the type of risks that § 91.151(a) was intended to alleviate given the size and speed of the small UAS. Additionally, limiting UAS flight minutes would reduce the utility of the flights for the roof inspections for which the exemption will be granted. State Farm believes that an equivalent level of safety can be achieved by limiting flights to 60 minutes or 25% of battery power, whichever happens first. The FAA issued an exemption to this regulation in Exemption No. 11062 and 10673.

G. 14 C.F.R. § 91.405(a) Maintenance required; 14 C.F.R. § 91.407(a)(1) Operation after maintenance, preventive maintenance, rebuilding or alteration; 14 C.F.R. §§ 91.409(a)(1) and (2) Inspections; 14 C.F.R. §§ 91.417(a) and (b) Maintenance records

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

Given that these sections and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply to the Petitioner. Maintenance will be accomplished by the operator pursuant to the Operations Manual. An equivalent level of safety will be achieved because these small UAS are very limited in size and will carry a small payload and operate only in restricted areas for limited periods of time. If mechanical issues arise, the UAS can land immediately and will be operating from no higher than 200 feet AGL. As provided in the Operations Manual, the operator will ensure that the UAS is in working order prior to initiating flight, perform required

maintenance, and keep a log of any maintenance performed. Moreover, the operator is the person most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety. The FAA issued an exemption to these regulations in Exemption No. 11062.

H. Such other relief as the FAA deems appropriate to enable the requested operations

State Farm also requests exemption from such other FARs as the FAA deems appropriate to enable the requested operations. If, during the effective dates of any Grant of Exemption issued pursuant to this Petition, the FAA issues interim or final rules for small UAS, State Farm requests that it be relieved of the requirements of any conditions and limitations of said exemption and allowed to comply with any less burdensome applicable regulations that may have become effective.

## **VII. SUMMARY TO BE PUBLISHED IN FEDERAL REGISTER**

*Petitioner:* State Farm Mutual Automobile Insurance Company

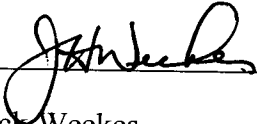
*Sections of 14 C.F.R. Affected:* Part 21 Subpart H; § 45.23(b); § 45.27; §§ 61.113(a) and (b); § 91.119(c); § 91.121; § 91.151(a); § 91.405(a); § 91.407(a)(1); §§ 91.409(a)(1) and (2); §§ 91.417(a) and (b).

*Description of Relief Sought:* Petitioner seeks relief from the requirements of 14 C.F.R. Part 21 Subpart H; 14 C.F.R. § 21.191(a); 14 C.F.R. § 45.23(b); 14 C.F.R. § 45.27; 14 C.F.R. §§ 61.113(a) and (b); 14 C.F.R. § 91.119(c); 14 C.F.R. § 91.121; 91.151(a); 14 C.F.R. § 91.405(a); 14 C.F.R. § 91.407(a)(1); 14 C.F.R. §§ 91.409(a)(1) and (2); 14 C.F.R. §§ 91.417(a) and (b) to conduct small unmanned aircraft systems (UAS) roof inspections subject to operating procedures that meet or exceed those that FAA requires for similar operations.

## **VIII. CONCLUSION**

Satisfaction of the criteria provided in Section 333 of the FMRA regarding size, weight, speed, operating capabilities, proximity to airports and populated areas, operation within visual line of sight, and national security, provide more than adequate justification for the grant of the requested exemption allowing operation of Petitioner's UAS for roof inspections pursuant to the Operations Manual. Please do not hesitate to contact Petitioner's outside counsel, R. Michael Senkowski at 202-719-7249 or [msenkowski@wileyrein.com](mailto:msenkowski@wileyrein.com) and Laura A. Foggan at 202-719-3382 or [lfoggan@wileyrein.com](mailto:lfoggan@wileyrein.com), with any questions about this filing.

Sincerely,



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Jack Weekes  
Operations Vice President  
State Farm Mutual Automobile  
Insurance Company

Attachments: Confidential Operations Manual and Training Syllabus