State Farm Insurance Companies®

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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. § 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; 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 operation of its small Unmanned Aircraft Systems ("UAS") for research and development ("R&D") related to use of UAS for civil operations, so long as such operations are conducted within and under the conditions outlined herein. State Farm requests such authorization to conduct outdoor R&D for its use of UAS for insurance functions, including using imagery and analytics in underwriting, re-underwriting, catastrophe response, roof inspection, and claim resolution settings. These R&D operations will help define the role of UAS technology in State Farm's business operations and will guide the company in the most appropriate implementation of such technology. Ultimately, incorporating UAS into State Farm's business processes will improve worker safety and expedite response and claim resolution for policyholders.

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.

State Farm's request for exemption for research and development is two pronged. First, State Farm seeks an exemption to permit the operation of small UAS for R&D at State Farm's own testing facility. This testing will be done under controlled conditions in airspace that is 1) limited, 2) predetermined, and 3) controlled as to access. This testing will give State Farm valuable information about how best to safely and efficiently deploy UAS for insurance functions, such as evaluation of policyholder claims, while also having the benefit of occurring in a controlled and safe environment.

Second, State Farm also seeks an exemption to permit the operation of its UAS to conduct R&D in "real world" situations during and immediately following an actual catastrophe such as hurricane, tornado, windstorm, flood, wild-fire, mudslide or similar event. State Farm's UAS operations in this scenario would be activated in coordination with the FAA and the official in charge of on scene emergency response activities. As explained further below, such testing will occur under conditions that limit the likelihood of operations over members of the general public and ensure full coordination with any manned aircraft operations. State Farm's use of UAS during and after actual catastrophes will educate the company on how the potential of UAS can be unlocked to assess the extent and severity of damage to insured property and enable State Farm to continue to provide remarkable customer service to its policyholders.

I. REQUEST FOR EXEMPTION TO USE UAS FOR RESEARCH AND DEVELOPMENT AT STATE FARM'S TEST SITES

A. Overview of Request to Use UAS for R&D at Test Sites Owned or Controlled by State Farm.

State Farm's first request involves the use of UAS to conduct R&D at State Farm's own facilities on property it either owns or leases providing a minimum of 100 acres of uninhabited rural farmland and located a minimum of five miles from any airport. Such property will be located within 50 miles of State Farm's corporate headquarters in Bloomington, Illinois. The testing facility is not open to the public and access will be restricted to State Farm employees or consultants engaged in test or test related work. UAS testing will occur in Class G airspace at altitudes of 400 feet or less. The test site may at times feature uninhabited structures, which will enable State Farm to test how UAS will operate and capture images over various types of buildings. 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.[1]

State Farm will be conducting R&D to determine how best to incorporate UAS into the company's business processes to further enhance customer experiences. State Farm will be evaluating how to utilize UAS to capture images and to determine the nature and extent of

[1] 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.

damage to policyholders' property. State Farm is specifically interested in studying how UAS can be deployed to obtain up-close images of a policyholder's roof and how State Farm can deploy UAS resources to areas hit by catastrophes. This testing will give State Farm the necessary information to be optimally positioned to serve policyholders who have suffered losses.

Petitioner thus requests authorization to perform R&D operations using UAS under the control of a pilot possessing at least a private pilot certificate and a third-class medical certificate (Phase I).

State Farm proposes that it also be granted authority to conduct UAS R&D flight operations using a person(s) holding only a third-class medical certificate, acting under the direct supervision and control of a person holding an FAA private pilot certificate (Phase II). State Farm's interest in utilizing the R&D environment to determine the extent to which certain UAS operations can safely be conducted using a non-FAA certificated pilot is logical outgrowth of State Farm's desire to conduct R&D to investigate the utility, efficiency and safety improvements from using UAS in its insurance business. The results of such R&D flights would inform the comments upon the UAS pilot licensing qualifications and requirements the FAA proposes in its imminent small UAS NPRM.

While Section 333 of the FMRA obviates the statutory requirement in 49 U.S.C. § 44704 for a civil aircraft to have an airworthiness certificate, the FMRA did not extend exemption relief to the 49 U.S.C. §§ 44702 and 44703 requirements that a civil aircraft be piloted by the holder of an airman certificate. In requesting this Phase II authority to conduct UAS R&D flight operations using a person(s) holding only a third-class medical certificate, acting under the direct supervision and control of a person holding an FAA private pilot certificate, State Farm notes that at this time, the holder of a third-class medical certificate, with a "Solo" endorsement is authorized to fly a full sized aircraft in the NAS. As long as student pilots avoid operation within the class of airspace which they are ineligible to enter, and do not carry passengers, they can fly within many classes of airspace in the NAS, including airports with control towers in Class C and D airspace. In the interest of developing empirical data on the efficacy of non-Private Pilot rated UAS operations, State Farm respectfully requests that it also be authorized to conduct Phase II R&D UAS flights, by persons holding only a third-class medical certificate, under the supervision and control of a licensed pilot.

State Farm's request for R&D testing at its own facilities also carries with it a number of benefits. It would be impractical for State Farm to use the six FAA-selected UAS test sites as the primary location for R&D at this time. First, among other scenarios, State Farm is interested in using UAS for roof inspections. UAS testing for roof inspection purposes would ideally occur by operating over a residential type of structure. Second, the nearest FAA approved UAS test site to State Farm's headquarters in Bloomington, Illinois is the Virginia Tech site—over 700 miles away. State Farm can conduct its R&D more efficiently and realize cost savings by having the tests occur in close proximity to State Farm developers. Third, to use the test sites, State Farm would have to obtain a special airworthiness certificate (experimental category) for the UAS. It would be an unreasonable burden for State Farm to obtain a special airworthiness certificate for every UAS design or testing configuration while the company is in R&D and conducting rapid prototyping. Repeating that process for each design variation would also

necessitate great use of FAA resources. State Farm can avoid these problems and conduct specifically targeted, safe, and economical testing at its own facilities.

B. Public Interest Benefits of Permitting Use of UAS for R&D at Test Sites Owned or Controlled by State Farm.

Grant of State Farm's request to operate UAS for R&D at its own facilities is decidedly in the public interest. As an initial matter, granting this petition advances Congress's goal of integrating civil UAS into the United States airspace safely and soon. Allowing State Farm to conduct R&D is a first necessary step toward realizing the consumer benefits of using UAS for insurance-related purposes. Grant of the instant request will enable State Farm to be ready to launch civil operations as soon as permitted by subsequent FAA action. Testing now will also improve safety later. In fact, R&D operation will help State Farm develop and test safety measures for UAS operation. State Farm will develop best practices for UAS operation using off-the-shelf technologies and will contribute to advancing automated features to mitigate human error. At State Farm's test sites, privacy will also be protected—all flights will occur over private or controlled access property. Any filming that may occur will be of people who have consented to being filmed or otherwise have agreed to be in the area where filming will take place.

In addition, as described in more detail below, operation will not create a hazard to aviation or the public. Flights will be conducted under 400 feet AGL—avoiding interference with users of the national airspace system ("NAS") —and will be suspended immediately to yield right-of-way to any other aircraft. At the test site, each UAS will be geo-fenced to ensure that it does not fly where it is not supposed to be. Operation will also not create a hazard to the public as State Farm will only operate the UAS over unpopulated areas. The test site will be secured and only authorized personnel will be permitted on the grounds. Further, the UAS operation poses no credible threat to national security due to its size, speed, location of operation, lack of explosive materials or flammable jet fuels, and inability to carry a substantial external load.

II. REQUEST FOR EXEMPTION TO USE UAS FOR RESEARCH AND DEVELOPMENT DURING AND AFTER ACTUAL CATASTROPHES

A. Overview of Request to Use UAS for R&D During and After Catastrophes.

The second component of State Farm's exemption request involves the use of UAS during and after real world catastrophes. State Farm has the largest catastrophe response team in the industry. Its catastrophe team workers are specially trained in catastrophe response and are ready to respond to catastrophic scenes 24 hours a day, seven days a week. Catastrophe locations cannot be predicted and are unlikely to occur at approved UAS test sites. And no test site can provide the scale, variability, complexity and unpredictability likely to occur during and after an actual catastrophe. State Farm requests the FAA grant an authorization for the company to conduct limited UAS operations for R&D purposes during and/or immediately following an actual catastrophe. The requested authorization could be granted in addition to, and as a part of, the relief sought herein.

State Farm will limit the likelihood of hazard to the general public on the ground by adhering to its Operations Manual(s); and complying with all conditions and limitations contained in a Grant of the relief sought, and all instructions from the FAA and the official(s)-in-charge of on scene emergency responsive activities during and/or following an actual disaster. State Farm will coordinate with the FAA and all first responders to ensure that the use of its UAS can occur safely and without impeding public safety efforts. State Farm's UAS operations will cease immediately at the direction of the applicable officials. Further, State Farm's UAS operations will be conducted with notice to manned aircraft and will at all times cede the right of way to such aircraft.

State Farm proposes that the process for obtaining access to a catastrophe area work as follows. When a catastrophe is expected to occur or has recently occurred, State Farm will contact the UAS Integration Office, AFS-80, the cognizant Flight Standards District Office, local Air Traffic Control Facilities, and the Official-in-Charge of on-scene emergency response activities, or whomever the FAA designates in the Grant. State Farm will give the applicable authorities a copy of its Grant and information about the location, UAS, and flight activities to be conducted. The UAS Integration Office will give State Farm permission to conduct flight operations subject to the conditions and limitations in the Grant. State Farm will coordinate with both the FAA and the officials in charge of on-scene emergency response activities prior to conducting its UAS R&D during or immediately following the actual catastrophe. State Farm will take direction from the FAA and the officials in charge of on-scene emergency response activities as to the location, duration and real-time coordination of its in-catastrophe UAS R&D operations.

With proper controls and coordination, as described herein, State Farm believes such operations can be safely conducted to avoid any risk to first responders, other aircraft and persons and property on the ground. During operation, State Farm will fly cautiously and safely to ensure that the UAS does not create any hazards to people or property. State Farm will also coordinate with manned aircraft and first responders. Safety is State Farm's top priority while gathering this valuable research information.

B. Public Interest Benefits of Permitting Use of UAS for R&D During and After Catastrophes.

Allowing State Farm to conduct real-world testing is the first step toward realizing the consumer benefits of using UAS for insurance purposes in the aftermath of a catastrophe. These flights will take place amid conditions that would be impossible to create at any test site. UAS operations at an actual disaster site will provide a wide range of aftermath conditions to test real-time coordination techniques, flight planning, and on-condition flight operations for State Farm's UAS and their operators. State Farm believes there is a substantial likelihood that such R&D operations in actual catastrophe conditions will greatly advance the company's ability to safely utilize UAS in such conditions. Testing now will result in even safer operations later. In addition to providing faster, more effective service to its customers, State Farm's UAS operations in actual disaster conditions may also speed overall post-disaster relief assessments in the event this data is shared with first responders, thereby allowing manned ground and aviation assets to do more vital tasks. Indeed, footage obtained by State Farm could materially assist first responders' knowledge of the catastrophe aftermath. In this regard, use of UAS may free up scarce ground and manned aviation assets for the most critical needs, and it may even save lives.

Operation during and after catastrophes also does not create a hazard to the public, as State Farm will cooperate fully with officials managing on scene response and will operate as far as practicable from persons on the ground. Operations will also not create hazards to manned flight, as manned flight will always maintain right of way over all UAS operations. Additionally, this exemption request provides that the operator will request a Notice to Airman ("NOTAM") as early as practicable prior to operations to alert other users of the airspace about the UAS operations. State Farm will make safety a priority for all of its UAS operations.

III. THE FAA HAS 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 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.[2] The FMRA illustrates Congress's 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, which 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.[3]

IV. APPLICATION INFORMATION

The names and addresses of the applicant are:

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[2] 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).

[3] 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).

Regulations from which the exemption is requested:

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;
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).

V. THE AIRCRAFT

State Farm specifically proposes to conduct R&D operations with UAS including the Aerialtronics Altura Zenith ATX8 and the Altavian Nova F6500.

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)

The Nova F6500 Aircraft is an all-electric drone that provides precision 3D mapping and real-time thermal infrared and high definition video capabilities. The system deploys in nearly every environment with minimal logistics due to its waterproof, lightweight and hand-launchable design. The F6500 efficiently collects high quality data and delivers real-time results with speed and accuracy. It is hand launched and capable of flying in all weather conditions, and landing on land or water. Specifications include:

- Wing Span: 108"
- Length: 67"
- Weight: 15 lbs. without payload (less than 20 lbs. with payload)

State Farm may also use aircraft with comparable characteristics and safety features. State Farm agrees that any UAS it uses for R&D will include, at minimum: geo-fencing at a maximum ceiling of 400' 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.

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.

VI. OPERATING PARAMETERS FOR UAS USE AT STATE FARM'S TEST SITES.

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 at a State Farm site for commercial operations under an FAA issued exemption include:

A. UAS Pilot and Observer

1. UAS operations during "Phase I" of R&D will be conducted by, at minimum, pilots holding a private pilot certificate and at least a current third-class medical certificate.

    a. During "Phase II" of R&D, UAS operations will be conducted by appropriately-trained persons holding third-class medical certificates under the direct, in-person supervision of a pilot holding both a private pilot certificate and a 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 the following: third-class medical certification, pilot certification where applicable, and completion of the associated 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 400 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 test site(s) described herein.

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.

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 operations are 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.ntsb.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.

VII. AIRCRAFT AND OPERATING PARAMETERS FOR UAS USE DURING AND AFTER CATASTROPHES.

In addition to the above parameters, State Farm agrees to be bound to the following limitations and conditions when conducting R&D using UAS during and after a catastrophe.

A. Procedure for Gaining Access to Catastrophe Area.

1. State Farm will contact the UAS Integration Office, AFS-80; cognizant

Flight Standards District Office; local Air Traffic Control Facility(ies); and Official-in-Charge of on scene emergency response activities (or whomever FAA designates in conditions and limitations of Grant) to request "activation" of its authority to conduct R&D operations at specified disaster location.

2. State Farm will provide the applicable authorities:

   a. A copy of its Grant of Exemption.

   b. Dates and times for all flights;

   c. Make, model, and serial or N-number of UAS;

   d. Name and phone number of the operator for the UAS and for the person responsible for on-site operations;

   e. Name and certificate number of pilot(s);

   f. Signature of exemption holder or representative;

   g. Description of flight activity, including maps/diagrams of area over which operations are occurring and essential altitudes.

B. Operations will be limited to the authorized areas.

C. Before and during operations, State Farm will coordinate with FAA and the on scene commander for area from which to operate the UAS.

D. Operations will cease immediately at the request of on scene officials. State Farm will vacate the area if so requested.

E. To the extent there are people on the ground, operations will be conducted as far as practicable from non-participating persons.

F. 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.).

G. Operator will request a NOTAM as early as practicable prior to operations to alert other users of the airspace about the UAS operations.

VIII. 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 including 14 C.F.R. § 21.191(a) Experimental

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[4] 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 UAS to be operated hereunder is less than 20 pounds including payload, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates 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, 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.

Petitioner also seeks relief from the requirements of 14 C.F.R. § 21.191(a) regarding experimental certificates for the same reasons as listed above. Given the size and limited operating area of the UAS to be used by State Farm, an exemption from this provision meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the FMRA.

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 word "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 word "experimental" can be placed. The word "experimental" will be 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

[4] 49 U.S.C. § 44701(f).

Sections 61.113 (a) & (b) limit private pilots to non-commercial operations. Because the UAS will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations in its Phase I R&D 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) & (b). The FAA issued an exemption to this regulation in Exemption No. 11062.

For its Phase II R&D, during which certified pilot UAS operators supervise PICs holding third-class medical certificates, State Farm can similarly achieve an equivalent level of safety. Again, the area of operation is controlled and restricted, and flights are pre-planned and satisfy the requirements in the Operations Manual. Because the PIC will have met the same training requirements as pilot-certified Phase I PICs and be under direct in-person supervision of a licensed pilot, Phase II R&D will be essentially as low-risk as Phase I. Accordingly, an equivalent level of safety will be met.

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 400 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. 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 people and property owners or official representatives who have signed waivers will be allowed 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 R&D 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 400 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.

IX. 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; § 21.191(a); § 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; 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) to conduct small unmanned aircraft systems (UAS) research and development operations at its own testing facility and in limited areas following catastrophes subject to operating procedures that meet or exceed those that FAA requires for similar operations.

X. 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 R&D related to the insurance industry pursuant to the Operations Manual. The requested two exemptions—one for R&D at a State Farm test site and one for real world catastrophe area R&D—can be granted separately or in the same Grant. Please do not hesitate to contact Petitioner's outside counsel, R. Michael Senkowski at 202-719-7249 or msenkowski@wileyrein.com and Laura A. Foggan at 202-719-3382 or lfoggan@wileyrein.com, with any questions about this filing.

Sincerely,

Jack Weekes
Operations Vice President
State Farm Mutual Automobile
Insurance Company

Attachment: Confidential Operations Manual and Training Syllabus