

Dear Sir or Madam,

Pursuant to §333 of the FAA Modernization and Reform Act of 2012 (the Reform Act) and 14 C.F.R. Part 11, JBI LLC, operator of Small Unmanned Aerial Vehicle (UAV) equipped to conduct aerial inspections for the Energy generation and distribution industries for pre-planned, controlled area, inspection services, hereby applies for an exemption from the listed Federal Aviation Regulations (FARs) to allow commercial operation of its UAS(Unmanned Aircraft System), so long as such operations are conducted within and under the conditions outlined herein or as may be established by the Federal Aviation Administration (FAA) as required by §333.

As described more fully below, the requested exemption would permit the operation of small, unmanned and relatively inexpensive multi rotor aircraft under controlled conditions in airspace that is 1) contained 2) predetermined 3) has on-site safety personnel controlling access, and 4) would provide increased safety to the public and enhancements to clients' business operations.

The name and address of the applicant is: JB Aerial LLC(JBI LLC), 11822 Deer Path Way, Orlando, Florida FL32832.

JBI LLC respectfully requests a grant of an exemption of the following sections of Title 14 of the Code of Federal Regulations:

- \* 14 CFR 91.7(a)
- \* 14 CFR 91.119
- \* 14 CFR 91.121
- \* 14 CFR 91.151(a)
- \* 14 CFR 91.405(a)
- \* 14 CFR 91.407(a)(1)
- \* 14 CFR 91.409(a)(1) and (2)
- \* 14 CFR 91.417(a) and (b)

## I. The Extent of JBI LLC Seeks and the Reason It Seeks Such Relief:

JBI submits this application in accordance with the Reform Act, 112 P.L. 95 §§331-334, seeking relief from any currently applicable federal aviation regulations pertaining to UASs (unmanned aircraft systems) and operating to prevent JBI contemplated commercial inspections, and other flight operations within the U.S. national airspace system.

The Reform Act in §332 provides for such integration of civil UASs into our national airspace system as it is in the public's interest to do so. JBIs lightweight UASs meet the definition of "small unmanned aircraft" as set forth in §333 and combined with a great safety record in similar industries, JBIs light duty UASs are ideal recipients of exemption by the intent of the Reform Act.

Considerations for relief include a combination of sUAS physical characteristics, safety features, and safe practices identified in §333:

- \* UAV weight,
- \* UAV overall size,
- \* UAV speed over ground
- \* UAV flight characteristics,

### 14 C.P.R. §91.7(a): Civil aircraft airworthiness.

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

### 14 C.F.R. §91.119: Minimum safe altitudes

§91.119 establishes safe altitudes for operation of civil aircraft. §91.119 (d) allows helicopters to be operated at less than the minimums prescribed, provided the person operating the helicopter complies with any route or altitudes prescribed for helicopters by the FAA. As this exemption is for a UAS that closely mimics the behavior of a helicopter, and the exemption requests authority to operate at altitudes up to 400 AGL, an exemption may be needed to allow such operations. As set forth herein, the UAV will never operate at higher than 400 AGL or beyond unaided visual line of sight, whichever is closer. It will however be operated in a restricted area with officials tasked

with ensuring public safety, and where buildings and people will not be exposed to operations without their pre-obtained consent and training.

The equivalent level of safety will be achieved given the size, weight, speed of the UAS as well as the location where it is operated. No flight operation will be taken without the permission of the controlling agency or right of way owner in the case of private property or local officials in the case of public property or private property with public interests. Because of the advance notice to the property owner and participants in the remote sensing activity, all affected individuals will be aware of the planned flight operations. Compared to flight operations with aircraft or rotorcraft weighting far more than the maximum 8.2kg of JBIs heaviest UAS proposed herein and the lack of flammable fuel, any risk associated with these operations is far less than those presently presented with conventional aircraft operating at or below 500 AGL. In addition, the low-altitude operations of the UAS will ensure separation between these small- UAV operations and the operations of conventional aircraft that must comply with §91.119.

#### 14 C.F.R. §91. 121 Altimeter Settings

§91.121 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, confirming the altitude of the launch site shown on the GPS altitude indicator before flight. The PIC and Technician will also ensure effective pairing with multiple GPS sources to guarantee accurate detection of height.

#### 14 C.F.R. §9 1.15I (a): Fuel Requirements for Flight in VFR Conditions

§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." The battery powering the UAS provides approximately 25 minutes of powered flight in hover mode with payload. JBIs UAS will not be able to meet the 30 minute reserve requirement in 14 CFR §91.151. JBI believes that an equivalent level of safety can be achieved by limiting flights to 30 minutes or 25% of battery power whichever happens first. This restriction would be more than adequate to return the UAS to its planned landing zone from anywhere within its limited operating area.

14 C.P.R. §91.405 (a); 407 (a) (1); 409 (a) (2); 417(a) & (b): Maintenance Inspections  
These regulations require that an aircraft operator or owner "shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in part 43 of this chapter...;" and others shall inspect or maintain the aircraft in compliance with Part 43. Given that these section and Part 43 apply only to aircraft with an airworthiness certificate, these sections will not apply to the applicant. Maintenance will be accomplished by the operator pursuant to the flight manual. An equivalent level of safety will be achieved because these small UAV 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. 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.

An exemption granted to JBI would permit its operation of lightweight, unmanned, remotely controlled, UAS in a tightly controlled environment with limited airspace. JBI utilizes specifically determined areas (designed flight zone) to mitigate injury and property damage while fulfilling clients' goals. Technical enhancements to current safety controls will allow JBI to operate exceeding current safety specifications, and stay ahead of, or meet, new ones being implemented by the FAA and Department of Transportation. Further, JBI conducts its operations in compliance with protocols described herein or as otherwise established by the FAA

## II. Commercial and Public Benefits

We at JBI believe that granting this exemption request furthers the public interest by providing safe (by way of an unmanned system) and efficient means to meet technical problems solvable by elevated data collection instruments. JBIs client base are typically business' looking to improve reliability and power delivery with their awareness of structures on their respective properties through data collection by photographic, video graphic based inspections. By moving these functions onto the UAS based platform the potential for loss of life or property is diminished due to the greater control in a smaller and safer aircraft that holds no persons. Second, there are no reactive or combustible materials on board the UAV and thus the potential for fire or explosions is greatly diminished. Third, the small size and extreme maneuverability of JBIs UAS allow the PIC to avoid hazards. Lastly, due to the nature of the remote sensing instrumentation onboard, the UAS can maintain quite a safe distance between the UAS and the object(s) undergoing scrutiny. Accordingly, JBI UAS have operated and will continue to operate at and above current safety levels.

## A. The costs and benefits of your proposed action to society in general and specific groups within society

The impact to society, financial and otherwise, would be extremely minimal. Indeed, it's been demonstrated that UASs have the ability to drastically increase the information available to policymakers at a fraction of the cost of measuring this data by terrestrial means. Electricity outages can be minimized, problems can be found before they become a hazard. One such impact would be inconvenience to directly proximal and non-essential personnel that would be displaced from public or business owned property if it is deemed to be unsafe. In this case we relay our needs for a flight zone with the requirement that it be safe from casual intrusions and allow the business time to shift operations in order to minimize potential safety issues.

### 1. The effect of an exemption for JBI on the quality of the natural and social environments

Utilizing UAS minimizes the requirement for conventional aircraft. This eliminates the need for an onboard pilot, time consuming adherence to regulations surrounding book keeping and submission of flight paths to local civilian or military airports, and detrimental effects to the environment caused by operating a combustible fuel based, large scale aircraft, with restrictions on the proximity to the target for remote sensing.

## III. Flight Capabilities and Characteristics of JBIs UAV

Pursuant to 112 P.L. 95 §333 (a), concerns for public safety are mitigated by the overall capabilities and 1 characteristics of the UAS. JBI UAS utilizes six (hex) or four (quad) counter-rotating propellers paired oppositely to each other for balance, control and stability. The total span of the UAS Hex is 900mm, Quad 350mm allowing for stable flight or landing even with the sudden onset of detrimental environmental conditions. The Hex UAS has a maximum unit takeoff mass of 8.2kg, The Quad has a maximum takeoff weight of approximately 1.5kg, including cinematic/photographic or other surveying equipment. JBIs UAS is designed to primarily hover in place to capture photographic data and then operate at less than a 50 knot maximum speed to the next point of interest. They are capable of vertical and horizontal operations but, in practice, is operated only within unaided VLOS of the Pilot. In addition to the PIC, JBI will utilize a Visual Observer (VO) which are within unaided verbal communication range. These personnel may be supplemented by safety officials provided by the client who are instructed to cordon off and otherwise minimize pedestrian access in the flight zone of the client's grounds. In the event of loss of visual of the UAV, the PIC can change flight controls from cartesian (X,Y,Z) based controls to radial (r,a ,h) based controls which allows the PIC to utilize one controller axis to recall the UAS to the PIC's position without concern to the current heading of the UAV. In the event of loss of sight of the sUAS into an area containing hazards or possible hazards, the spotter or pilot has a heads-up-display containing a live video feed which can be used to locate the UAV while it maintains it's position in hover mode. The UAS has demonstrated it's ability to

maintain its position by GPS coordinates in hover mode in "-'25kph wind gusts at 2.5m representing an extreme environmental condition beyond the range of conditions within the scope for UAV operation. All of JBI's UAV utilize LiPo (lithium polymer) battery based power sources, decreasing safety risks from more easily combustible, fuel based, power sources. Flight times generally last between fifteen (15) to twenty five (25) minutes allowing the staff to work with small flight areas per phase. The maximum flight time without payload is 45 minutes, however practical safe operation limits this to 30 to give ample time to control the UAS to a safe landing zone. JBI further restricts flight time by not operating its UAS with less than twenty five percent battery capacity. Further safety management systems in place include a GPS mode that allows JBI UAV to hover in place and land if communication with the PIC is lost and optionally follow a set of waypoints at a set speed and height to a 'home base' pre-designated safe landing zone. In the event of unforeseen motor failure, the Hex system will enter into a controlled hover mode while allowing full use of all UAS flight controls by the PIC. All commands sent via remote controller received during a controlled return to land are translated to an 'as meant' paradigm meaning the flight control package will use its realtime 3 dimensional position and compensate rotors control the UAS regardless of spin velocity. Landing gear is also programmed to deploy based on sensing of range to ground from non-GPS based sources. This assures that if one system is compensated a safe and successful landing can still occur.

#### **IV. Reasons Why an Exemption to JBI Will Not Adversely Affect Safety Standards**

JBI contends that operation of its UAS will not "create a hazard to users of the national airspace system or the public:" as stated in 112 P.L. 95 §333 (b). Given the diminutive size and weight of JBI's UAS, combined with their operation in cordoned off and well-controlled areas, JBI's UAS falls within Congress's contemplated safety zone. JBI's UAV have an established safety record. The pilots have many years of hobby UAS flying and a combined total 37 years full size helicopter flying within the Oil and Gas Industry, EMS, Army Aviation and part 135 operations. Bolstered by multi-point preflight checklist, General Operations Manual, Maintenance Manual, Training guides and awareness of their surroundings and intimate knowledge of the FARs and behavior of the UAV platform in many weather conditions. JBI's safety record and implemented operational practices demonstrate an awareness of public safety.

JBI operations routinely provide a level of safety at least equal to existing rules, and in nearly every instance, exceeds existing rules. JBI has worked very closely with the regional vendors and support for this unit to create a tightly integrated and highly fault tolerant platform that has been tested thoroughly by a vendor with a proven record for safety and solid designs.

Though it does not mitigate safety it is of note that as of Nov 2014 there are few companies that will insure UAS operations and UAS based companies. The UAS of use at JBI is one of two models (by current awareness) that qualify for protection against damages or injury. JBI also continues to work closely with this organization (FAA) to

identify and mitigate UAS platform risk due to their expertise in several industries closely related to the aviation and transportation.

JBI does not intend to operate its UAS on or near airports unless permission is granted and generally has only operated its fleet on grounds with cordoned off areas or areas under the control of the property owner I client with assistance by safety officials employed by the business. JBI determines the areas needed to fulfill the clients' goals and only operates its UAVs in these flight zones and only in compliance with well regarded safety protocols set forth initially by the RC UAS trade and hobby groups and recently by relevant FARs.

JBI standardized on the following practices to ensure safe operation of it's UASs:

- \* Work with on-site personnel to plan the flight goals,
- \* Work with on-site personnel to restrict access to non-essential persons,
- \* Operation by unaided VLOS operation only,
- \* Operation in phases 30 minutes max in length,
- \* Operation to minimal 25% battery power,
- \* Operation of device to GPS aided readout to 400ft at maximum,
- \* Numerous pre-programmed fail-safes that ensure specific behavior per issue,
- \* Three main roles supplemented by on-site safety personnel,
- \* Employ controlled lifecycle and total time management of components to guard against component failures,
- \* Subscribe to relevant local weather and safety alerts,

Expertly choose data collection instruments and accessories to minimize flight requirements or expertise,

JBI has experience in similar fields and has adapted this experience in it's use of UAS's to increase safety. In combination to the ever expanding knowledge repositories from hobbyists and experts alike, JBI is constantly evolving it's practices when there is a clear benefit to operations or increased safety element.

## A. 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:

JB I {applicant} seeks an exemption from the following rules: 14 C.F.R. §§61.113 14 CFR 91.7 (a); 91.119; 91.121; 91.151(a); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); 91.409 (a) {2} and 91.417 (a) & (b) to operate commercially a small unmanned vehicle (8.2kg or less) in elevated photographic and remote sensing operations.

Approval of exemptions allowing commercial operations of UAS in the the media industry will enhance safety by reducing risk associated with conventional aircraft operations and other means of elevated remote sensing involving persons. The public benefit served by approval of this petition is increased awareness of characteristics of difficult imaging targets. A UAS weighing fewer than 8.2kg and powered by sealed batteries eliminates virtually all associated risk inherent in operating conventional aircraft in close proximity to buildings or persons or otherwise elevating persons to a position they would be able to collect needed data.

The operation of small UAS's, weighting less than 8.2kgs, conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial operations. As identified and described herein, Gary Boozer and David James, and their company JB Aerial LLC (JBI LLC), are experienced, aviation professionals in the various industries. Gary Boozer and David James have a combined 37 years of violation, incident and accident free aviation experience. The FAA has been given the authority to issue the exemption to JB Aerial LLC (JBI LLC) pursuant to the Federal Aviation Act, 85 P.L. 726 (1958), and as such, we humbly seek your consideration and approval of this petition.

David James

Gary Boozer