

**SMALL UAV
COALITION**
*A Partnership for
Safety & Innovation*

April 22, 2015

Honorable Michael Huerta
Administrator
Federal Aviation Administration
800 Independence Avenue SW
Washington, DC 20591

Re: sUAS Notice of Proposed Rulemaking, FAA 2015-0150: Comments of Small UAV Coalition

Dear Administrator Huerta:

The Small UAV Coalition¹ provides the following comments in response to the Notice of Proposed Rulemaking entitled “Operation and Certification of Small Unmanned Aircraft Systems,” 80 Fed. Reg. 9544 (Feb. 23, 2015).

General comments

The Coalition supports the general framework of the proposed rule. The Coalition understands and endorses the FAA’s incremental, data-driven, risk-based approach. We are also pleased the FAA favors performance standards over design standards, intended to “give the regulated parties the flexibility to achieve regulatory objectives in the most cost-effective manner.” We agree with the FAA’s statement that “the distinction between design and performance standards is particularly important where technology is evolving rapidly, as is the case with small UAS.” 80 Fed. Reg. at 9552.

The Coalition also supports the creation of a separate regulatory scheme for micro UAS operations based on the FAA’s recognition of the reduced risk posed by such operations and the successful implementation of a similar regulatory framework in Canada and other jurisdictions.

The Coalition commends the FAA for employing the risk-based approach noted above to obviate aircraft certification (both type and airworthiness certificate) for the small UAS as well as private pilot certification for the sUAS operator. In its grant of exemptions under section 333 of the FAA Modernization and Reform Act of 2012, and also reflected in this proposed rule, the FAA has determined that small UAS may be operated safely in the national airspace (“NAS”) under

¹ Members of the Small UAV Coalition are 3D Robotics, Aerialtronics, Airware, Amazon Prime Air, Botlink, Drone Deploy, DJI, EHANG, Intel, Google [X] Project Wing, GoPro, HAZON Solutions, Kespry, Parrot, PrecisionHawk, Sky-Futures, Skyward, Strat Aero, SkyPan, Transport Risk Management, Verifly, and Zero Tech.

limited circumstances, without having to go through protracted and expensive type-, production-, and airworthiness certification.

As the Coalition has long advocated, the FAA should, as proposed, replace private pilot certification with an unmanned aircraft operator certificate with small UAS rating based solely on passing an aeronautical knowledge test. This is welcome recognition that the knowledge and skills needed to safely operate a sUAS are not the same as those needed to fly a manned aircraft.

As a matter of best practices, the Coalition believes that some UAS flying experience should be gained before an operator flies a sUAS for commercial purposes. However, the nature and extent of such flying experience is best left to the operator and the operator's employer to determine.

The Coalition recognizes that the FAA is amenable to the adoption of a separate regulatory scheme for sUAS operations because the sUAS operations proposed in this rulemaking (and authorized in section 333 exemptions) are confined to operations within the visual line of sight of the operator and subject to a number of other limitations. As a general matter, the FAA does not propose to rely on any technological capability to authorize a sUAS operation within the proposed parameters, other than implicitly recognizing the battery power and control platform software. Yet there are many technological capabilities, such as geo-fencing and return-to-base programming, which currently are being used by sUAS operators in other countries that achieve and surpass the level of safety attained by a pilot's control of aircraft.

Going forward, the Coalition understands that authorizing beyond visual line of sight operations (BVLOS) on a large scale – in urban, suburban and densely populated areas and other areas where UAS operations may proliferate (i.e., designated corridors or routes) – may require a new approach to air traffic management through systems such as an unmanned aircraft traffic management system ("UTM"). Also, sense- or detect- and avoid technology may need to be developed and deployed to ensure safe separation (de-confliction) of all aircraft, manned and unmanned, in uncontrolled and controlled airspace. As explained below, we believe that in certain circumstances BVLOS operations may be conducted safely and should be authorized in this rulemaking.

For airspace management, the Coalition supports the efforts of the NASA Ames Research Center and of private companies that are working with NASA Ames or with others in designing a UTM. The Coalition does not believe that the FAA should establish or require a single UTM design. Rather, the FAA should set up a process to evaluate and approve a UTM design for a particular portion of airspace, and thereafter to provide appropriate regulatory oversight.

For sense-and-avoid technology, the FAA has the authority under current laws and rules to certificate or otherwise authorize this technology either as a stand-alone aeronautical product or as part of a UAS (platform and UAV). We suggest below that the FAA adopt such an authorization process, which would focus on performance rather than design, and which could be authorized through deviation authority (or in some cases through certification), in advance of, or in place of, regulatory revisions.

Micro UAS classification

The Coalition strongly supports the creation of a separate regulatory scheme for micro UAS. The FAA proposes a weight limit of 4.4 pounds, including any payload, and an airspeed limit of 30 knots, based on a similar concept in Canada, and based on the recommendations of the Aviation Rulemaking Committee (“ARC”). 80 Fed. Reg. at 9557. The FAA also suggests certain limitations to reduce risks so that a micro UAS may be operated over persons not directly involved in the operation, and the operator of such micro UAS would be permitted to self-certify the operator’s aeronautical knowledge.

The basis for establishing a micro UAS category is the FAA’s belief, with which the Coalition agrees, that a sUAS operator should be given more leeway where the safety risks are negligible. The Coalition believes that FAA could allow even more leeway for the operation of micro UAS without increasing safety risks. As currently drafted, the parameters of such a micro UAS category are more restrictive than necessary.

Specifically, where the FAA has discretion,² it proposes several limitations the Coalition believes are not necessary, given the significantly reduced risk because of the light weight of the UAV and the slower airspeed.

- (1) **Airspace.** We have no objection to confining micro UAS operation to Class G airspace. However, we do not see a material difference between the FAA’s proposed limit of 500 feet AGL and the suggested limit of 400 feet AGL for micro UAS operations.
- (2) **Automation.** We see no reason to forbid the micro UAS operator from using automation to control the flight path, especially where the micro UAS must remain within the visual line of sight of the operator. For multirotor micro UAS, all flight systems necessarily incorporate some level of automation, without which it would be impossible to steer the aircraft. Automation also removes human error and increases the level of safety in a sUAS operation. Autopilots can better adjust to changes in wind and to reorientation of the sUAS. It is far more difficult safely to operate a sUAS manually from a distance than to operate it with GPS waypoint and computer vision-assisted flight.
- (3) **Airports.** We also see no reason to differentiate between small and micro UAS with respect to distance from airports. We believe the FAA’s functional proposal for small UAS is preferable to a bright line of 5 miles the FAA suggests for a micro UAS.
- (4) **Range.** We see no reason to limit the distance of the operation to 1,500 feet. While we expect most micro UAS operations would be conducted well within this distance, we do not see a material increase in risk for operations beyond 1,500 feet given that they must remain within the visual line of sight of the micro UAS operator.

² The FAA notes that in two respects it has no discretion: the micro UAS operator would be required to obtain an unmanned aircraft operating certificate (with a micro UAS rating), and the unmanned aircraft would be required to be registered.

- (5) **Frangible construction.** The FAA also requests comments on whether a micro UAS must be made out of frangible materials that “break, distort, or yield on impact.” Instead of this specific design standard, the Coalition recommends a performance standard to minimize risk on impact. Because the technology and designs of sUAS are changing at a frequent pace, any specific prescription on materials (e.g., how flexible must a material be to render it “frangible”?; what portion of a sUAS must a sUAV be composed of frangible material?) might hinder innovation and leave the industry with vague and undefined rules. Rather, the limits on the potential kinetic energy (speed and mass) of the micro UAS category assure a baseline level of safety.

Even considering all of the FAA’s suggested limitations, the micro UAS concept holds promise of opening up the Class G airspace for many salutary purposes. Accordingly, the Coalition supports a micro UAS category, and requests that the FAA revise several parameters in line with risk-management principles reflected in the sUAS proposed rule.

Further, the Coalition does not believe the 4.4 pounds limit suggested by the FAA should be set in stone. Experience with micro UAS operations in the United States and other countries should permit the FAA to expand the concept of micro UAS by increasing the maximum weight, even by the time the FAA publishes a final rule. We therefore urge the FAA, should it adopt a micro UAS category, to include a provision that authorizes the Administrator, on a suitable risk-management showing, to adjust the weight limit above 4.4 pounds, either through a general notice to the public or by issuance of deviation authority.

Beyond visual line of sight operations

In the preamble, the FAA invites comment on whether it should permit beyond the visual line of sight (BVLOS) operations in the final rule (or in a future rulemaking), perhaps by deviation authority (i.e., a certificate of waiver or authorization), “once the pertinent technology matures to the extent that it can be used to safely operate beyond visual line of sight.” 80 Fed. Reg. at 9551, 9560-61. The Coalition strongly believes the FAA should authorize certain BVLOS operations in this rulemaking. BVLOS technology has already matured to the point that BVLOS operations are now permitted in some other countries, such as the Czech Republic, France, Poland, Sweden, and Norway, where BVLOS operations have been conducted for years with high levels of safety.

The Coalition believes that whether and under what circumstances BVLOS operations may be permitted should depend not only on technological capabilities of the sUAS but also on the operational circumstances of a sUAS operation (i.e., airspace, altitude, and the geographic area). For example, operation of a sUAS BVLOS in a rural or remote setting, such as timberland or desert, or entirely over a person’s property, may not require the degree of technological capability as BVLOS operations in suburban or urban environments necessitate.

Use of deviation authority, letter of agreement, or Notice to Airmen (“NOTAM”), would give the FAA the flexibility to permit certain BVLOS in the relatively near term rather than in a future multi-year rulemaking.

In France, operations have been certified for limited BVLOS operations using a micro UAS through the use of a variety of techniques, including using forward-looking vision systems so that the operator can locate any potential conflicts and correct course; the use of commercial flight control systems which can respond to a wide range of contingency management procedures; and through the use of procedural separation which requires the operator to keep operations out of controlled airspace and at low altitude.

Many commercial flight control systems offer contingency management functionality, allowing the UAS intelligently to respond to a variety of issues facing the aircraft. It would be critical to make contingency actions programmable, as flight systems which just simply execute a return to base and land procedure for example, could send the aircraft on a course that intersects with a structure or other obstacle. So as noted above, technology currently exists to extend see-and-avoid capabilities (vision-based systems, and ADS-B out transponders small and cost-effective enough for sUAS), and to mitigate the risk of a loss of positive control. This is of course suitable only for uncontrolled airspace as these vision systems, flight systems, and transponders are not currently certified by the FAA, but their use would ensure safety in uncontrolled class G airspace where risks to people and property in the air and ground could be sufficiently mitigated.

In addition to the comments above, there are current standards that have been developed by ASTM subgroup F38 which are designed to ensure higher levels of safety for operations that pose a higher risk like BVLOS or flights over populated areas. The combination of procedural separation by the filing of NOTAMs, utilization of fly away protections like geo-fencing and contingency management, the use of vision systems on the aircraft, utilizing ADS-B in environments where other low altitude traffic may be present, design and testing to industry standards, and the use of known reliable flight control systems, ensures the safety of BVLOS operations in uncontrolled airspace.

The key, in the Coalition's view, is for the FAA to establish a process by which it may authorize the BVLOS operation of a sUAS (or at least Extended Line of Sight operations) based on the operational circumstances of the mission, technological capabilities of the sUAS, if needed, and the training and experience of the sUAS operator. The FAA also should foster the implementation of BVLOS operations through both simulated and live testing, which other countries have initiated.

Containment and loss of control

We commend the FAA for electing to propose a performance standard to address the risk of loss of control link, and for not requiring any equipage or navigation technology. The FAA instead sets up a contained area in which a sUAS may be operated (i.e., within the visual line of sight of the operator, and below 500 feet AGL), and then proposes to require the sUAS operator to conduct a pre-flight check to ensure the control link is functioning properly and to assess the operating environment, as well as proposes a speed limit and to prohibit the small UAV from operating over any person not directly involved with the operation. The Coalition addresses these requirements in the section-by-section comments below. With respect to technology, while the Coalition agrees with the FAA's proposal not to mandate any technology, we note that flight termination and return-to-base technology now exists and the FAA should allow operators to rely

on it to relax some of the operational constraints in proposed Part 107. Indeed, in granting section 333 exemptions, the FAA has regularly recited a petitioner's statement that its UAS is equipped with geo-fencing and return-to-base capabilities to avoid risk to persons on the ground.

Risk-based framework for regulation, certification, and approvals

Beyond the restricted use case set out in the FAA's proposed rule, the Coalition proposes the FAA adopt a non-rulemaking framework to allow for other, less-restricted use cases of sUAS in the NAS based on a risk-based approach adapted from the foundational concept of an equivalent level of safety. We note that the FAA has employed this concept in granting exemptions under section 333, and we agree that the level of safety of sUAS operations generally surpasses the level of safety of manned aircraft simply because there is no risk of death or injury to passengers or crew.

In the proposed rule, the FAA also uses the term "acceptable level of safety." In the preamble, FAA states that its "regulatory objectives are to enable integration of small UAS into the NAS in a manner that does not impose *unacceptable* risk to other aircraft, people, or property." 80 Fed. Reg. 9552 (emphasis added). In deciding not to require any flight termination system or equipment to address the risk of a loss of control, the FAA states: "Since small UAS operations subject to this rule pose a lower level of risk, there are operational alternatives available to mitigate their risk to an *acceptable level* without imposing an FAA requirement for technological equipment and airworthiness certification requirements." 80 Fed. Reg. 9562 (emphasis added).

The Coalition agrees that achieving an acceptable level of safety should be the touchstone for authorizing sUAS operations. For sUAS operations, especially for BVLOS operations and operations the safety of which depends on automation, the safety determination should be made in the context of the operating environment, such as operations in uncontrolled airspace and at altitudes not frequented by manned aircraft, consequentially posing lower risks.

The Coalition suggests that the FAA revise several proposed categorical restrictions – such as no BVLOS operations; no sUAS operations at night; no operations over any person not directly involved in the operation; and no sUAS operator may operate more than one sUAS at any one time – to authorize such operations, through the exemption or deviation authority of the Administrator, or through certification of the system, vehicle, or product, upon a showing that such operations may be conducted without an appreciable increase in risk that is not sufficiently mitigated. Based on the risks identified and mitigated, there would be a continuum of authority, from a letter of agreement, to exemption or deviation authority, to certification.

The Coalition suggests that such an approach should be focused on the principles of safety, responsibility, reliability, and compliance.

Safety: The concept of operations should define a level of safety, adapted from the equivalent-level-of-safety concept that applies to existing categories of manned aviation, but scaled by contemplating relative levels of kinetic energy and technological capabilities and the concomitant reduced risk to other aircraft, people and property on the ground.

Responsibility: Manufacturers and operators will take a leadership role in ensuring that designs meet necessary standards and systems are used as intended. Companies need to develop their own standard operating procedures (“SOPs”) and operator training protocols.

Reliability: This defines the design reliability target in order to make the safety case for approval of sUAS vehicles, products, and operations beyond what the FAA proposes to authorize in this rulemaking. This reliability level is derived from the safety case.

Compliance: Manufacturers and operators must comply with applicable FAA rules and manufacturer and operator manuals. The Coalition fully supports the FAA’s approach, outlined in the proposed rule, to allow restricted use of sUAS without any aircraft certification requirements. For less restricted use, some sort of vehicle, system or product approval may be needed.

Taking a risk-based approach provides a path to evaluate the widest possible variety of concepts of UAS operations and to match the rapid pace of technology advancement in the small unmanned aircraft industry. For example, for sUAS operations away from populated areas, a higher rate of failure can still achieve the targeted level of safety.

Artifacts for certification, which are data and analysis from simulation and testing that validate the system meets the certification level required for the operation, will be built following quality system processes and standards.³ The Coalition believes that approval of UAS platforms and technologies can be accomplished through working with a Designated Engineering Representative (“DER”) or Designated Airworthiness Representative (“DAR”), by an operator or operator employer self-certification in accordance with ASTM or other suitable standards. We note that FAA currently is using DARs to grant experimental category airworthiness certificates. Each company would be responsible for making its own case to the FAA.

Section-by-section comments

Part 21

The Coalition supports the FAA’s proposal to create a new Part 107 and remove small UASs from the aircraft certification requirements in Part 21.

Part 43

The Coalition supports the FAA’s proposal to create a new Part 107 and remove small UASs from the aircraft maintenance requirements in Part 43.

³ Relevant quality systems and standards include ISO, Capability Maturity Model Integration (“CMMI”), and AS 9100.

Part 45

The Coalition supports the FAA's proposal to create a new Part 107 and remove small UASs from the aircraft identification and marking requirements in Part 45.

Part 47

The Coalition supports the FAA's proposal to create a new Part 107 and remove small UASs from the aircraft registration requirements in Part 47.

Part 61

As a general matter, the Coalition supports the FAA's proposal to create a separate set of requirements to qualify an operator of a small UAS, and thus to remove operators of small UASs from the requirements in Part 61. Our comments addressing the aeronautical knowledge test requirement are provided below. The Coalition supports the FAA's proposal to revise 14 C.F.R. 61.193 to permit a certified flight instructor to accept an application for an unmanned aircraft operator permit, and to revise section 61.413 to allow a certified flight instructor with sport pilot rating to do the same.

Part 91

The Coalition supports the FAA's proposal to create a separate set of operational requirements and remove operators of small UASs from the provisions of Part 91, except insofar as proposed Part 107 would incorporate those requirements (i.e., relating to alcohol and drug use and testing, and flight restrictions subject to a Notice to Airmen ("NOTAM")).

Part 101

The Coalition has no objection to the FAA's proposed section 101.41 that restates the Special Rule for Model Aircraft enacted in section 336 of the FAA Modernization and Reform Act. The Coalition does not object to the FAA's proposed section 101.43 that "No person may operate a model aircraft as to endanger the safety of the national airspace system." We do not consider this proposed section to provide any greater enforcement authority over model aircraft operations than the FAA currently exercises under 14 C.F.R. 91.13(a) ("No person may operate an aircraft in a careless or reckless manner so as to endanger the life or property of another."), which the FAA proposes to apply also to small UAS operators under proposed section 107.23. If the FAA intends this prohibition to have a different scope, the FAA should explain that in the preamble to the final rule.

The Coalition also notes that the FAA's interpretation of the Special Rule, 79 Fed. Reg. 36172 (June 25, 2014) has generated over 30,000 comments from the public. We urge the FAA to complete its consideration and disposition of these comments in the near term.

Part 107 – Subpart A -- General

Section 107.1 – Applicability

The FAA proposes to exclude air carrier operations from Part 107. We do not agree. The FAA explains that transporting property for compensation would require an air carrier certificate under section 44711 of the Title 49. Although the FAA explains that “there is an expectation of safe transportation when payment is exchanged,” 80 Fed. Reg. at 9553, the touchstone of air carrier certification is the safety of the traveling public and crew on board the aircraft. As the FAA has recognized in granting section 333 exemptions, a sUAS operation inherently poses no risk to passengers or crew. In the preamble, the FAA states that Part 107 would allow a company to transport property using a sUAS in furtherance of the company’s own business, but that a company would not be permitted to do so for compensation from a third party. 80 Fed. Reg. at 9553. There is no apparent safety rationale for such a distinction, at least insofar as sUAS operations are concerned.

The FAA seeks comment on whether small UASs should be permitted “to transport property for payment within the other constraints” of proposed Part 107. The Coalition strongly believes that FAA should permit such operations. If the FAA believes that section 44711 requires air carrier certification, FAA should provide in Part 107 for a streamlined certification process that focuses solely on any risk attendant to transporting property.

Similarly, the Coalition does not agree with the FAA’s proposal to exclude external load operations from the scope of Part 107. “External load” is defined in 14 C.F.R. 1.1 as “a load that is carried, or extends, outside of the aircraft fuselage.” It is thus apparent that small UAVs were not contemplated when this definition was adopted. The Coalition seeks confirmation that a gimbal and camera or similar sensor affixed to a UAV is not considered an “external load” because these are not subject to being jettisoned as an intended part of the UAS operation or otherwise.

In the preamble the FAA finds that allowing small UAVs to conduct external load operations involves a greater degree of risk, concluding that FAA cannot find that certification is not required. The FAA does, however, invite comments on whether such operations should be permitted, upon certification, with additional airman certification, and subject to any operational limitations. 80 Fed. Reg. at 9553. The Coalition does not agree that a greater degree of risk posed by external load operations necessarily requires, in all settings, either airworthiness or additional airmen certification. We urge the FAA to adopt a section in Part 107 that permits external load operations by a small UAS, upon a finding that the operation or series of operations can be conducted safely in consideration of the technological capability of the sUAS (both vehicle and control platform), the qualifications of the operator, and the operational environment. The Coalition notes that the technology exists now safely to transport packages by means of a sUAS.

The Coalition agrees with the FAA’s statement that sUAS operations in the airspace above “the U.S. territorial sea” – 12 nautical miles from the coastline – would be operating within the United States under Part 107. The Coalition seeks confirmation that sUAS operations over water

and beyond 12 nautical miles may be conducted under Part 107 so long as these operations are within the U.S. Flight Information Region and not “over the territory of a contracting State.”

Section 107.3 – Definitions

The Coalition supports the proposed definition of “small unmanned aircraft” to weigh less than 55 pounds, “including everything on board the aircraft.”

Section 107.5 – Falsification, reproduction or alteration

The Coalition supports this proposal to prohibit intentionally false or fraudulent documents used to show compliance with Part 107 and that such false or fraudulent record or report warrants enforcement action.

Section 107.7 – Inspection, testing, and demonstration of compliance

The Coalition supports the FAA’s proposal to subject sUAS operators to a similar set of requirements that apply to manned aircraft operators to make certain records available upon request and to allow the FAA, upon request, to inspect the UAS, the operator, or the visual observer to determine compliance with Part 107.

Section 107.9 – Accident reporting

The Coalition supports the FAA’s proposal to require sUAS operators to report to the FAA within 10 days of an accident involving “any injury to any person,” but believes the proposal to require the reporting of “damage to any property, other than the small unmanned aircraft,” is too broad. We believe that only damage to the property of someone not involved in the UAS operation should be reported. Operation of UAVs may result in minor damage to property owned or leased by the person or company conducting the operations.

Part 107 – Subpart B – Operating Rules

Section 107.11 – Applicability

The Coalition notes that this section contains no requirements.

Section 107.13 – Registration, certification, and airworthiness directives

The Coalition supports the FAA’s proposal to prohibit the operation of a sUAS unless the operator has an operator certificate with small UAS rating and complies with all applicable airworthiness directives, and unless the UAV displays its registration number in compliance with section 107.89.

Section 107.15 – Civil unmanned aircraft system airworthiness

The Coalition supports the FAA’s proposal to require a preflight inspection to determine airworthiness and to prohibit the operation of a sUAS unless it is in a condition for safe operation, as well as to require a sUAS operator to discontinue a flight when the operator knows

or has reason to know that continuing the flight would pose a hazard to other aircraft, people, or property. While the FAA does not explicitly require certificated operators to comply with manufacturer requirements, we believe this is a sound practice, one which will help to ensure that the sUAS will be in a condition for safe operation. We suggest the FAA consider adopting its standard term in a section 333 exemption that the operator “must follow the UAS manufacturer’s maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.”

Section 107.17 – Medical condition

The Coalition applauds the FAA for proposing to replace medical certification with a requirement that the operator and any visual observer determine physical and mental fitness to perform their responsibilities safely, under a “knows or has reason to know” standard.

Section 107.19 – Responsibility of the operator

The Coalition supports the FAA’s proposal to place operational control responsibility on the sUAS operator, which the FAA proposes to define in 107.3 as “a person who manipulates the flight controls of a small unmanned aircraft system”, for line-of-sight operations authorized under Part 107. The Coalition agrees that the operator must ensure that the sUAV will pose “no undue hazard” to persons, property, or other aircraft in the event of a loss of control, for any reason.

Section 107.21 – Maintenance and inspection

The Coalition supports the FAA’s proposal to require the sUAS operator to conduct a preflight inspection to determine that the sUAS is in a condition for safe operation and for the operator to maintain the sUAS in such a condition.

Section 107.23 – Hazardous operation

The Coalition supports the FAA’s proposal to apply the prohibition on careless or reckless operation in 14 C.F.R. 91.13(a) to UAS operators.

The Coalition also supports the FAA’s proposal to prohibit an operator from dropping an object from a small UAV “if such action endangers the life or property of another,” adapting a similar prohibition in 14 C.F.R. 91.15. Implicit in this prohibition is that an operator would be permitted under Part 107 to drop an object – like a package, a life preserver, or pesticides, depending on the nature of the operation – provided that it is done safely. We note that current section 91.15 provides that “this section does not prohibit the dropping of any object if reasonable precautions are taken to avoid injury or damage to persons or property.” We agree that dropping an object from a small UAV would not and should not be categorically presumed to endanger life or property. This proposed prohibition appropriately focuses on the facts and circumstances of the particular operation.

As explained above, the Coalition urges the FAA to permit external load and air carrier operations by a small UAS.

Section 107.25 – Operation from a moving vehicle or aircraft

The Coalition supports the FAA’s proposal to prohibit the operation of a sUAS from a moving aircraft. The Coalition supports the FAA’s decision not to prohibit the operation of a sUAS from a boat or vessel on water, as some sUAS operations, such as inspection of a bridge over a body of water, may be conducted effectively only from the water. Also, a sUAS may be used to rescue a person in trouble in a body of water, whether by identifying the location of such person or by dropping a life preserver.

The Coalition does not agree with the FAA’s proposal categorically to prohibit the operation from a moving vehicle on the surface. While such operations generally may pose a greater risk than operations from the ground, sUAS operators should be permitted to obtain authority from the FAA in certain limited circumstances (whether an exemption or deviation authority, such as a certificate of authorization or waiver) where the operator can operate the sUAS safely from a moving surface vehicle by mitigation of any appreciable increase in risk to persons, property or other aircraft.

Section 107.27 – Alcohol or drugs

The Coalition supports the FAA’s proposal to apply the drug and alcohol rules (91.17, operating under the influence, and 91.19, carriage of drugs) to sUAS operators as well as to visual observers.

Section 107.29 – Daylight operation

The Coalition does not agree with the FAA’s proposal to confine sUAS operations to the time between the hours of official sunrise and official sunset. We sympathize with the FAA’s desire not to impose an equipage or certification requirement for nighttime operations, and applaud its willingness to consider “any reasonable mitigation which would ensure that an equivalent level of safety is maintained while operating in low-light areas.” 80 Fed. Reg. at 9561. We believe that FAA should allow nighttime sUAS operations where such operations may be conducted safely without any appreciable increase in risk to other aircraft or persons on the ground and where the sUAS operator is able safely to perform the see- or detect-and-avoid responsibilities.

We note that the UAS ARC recommendations document the FAA placed in docket states, at page 37: “Night operations may be deemed as safe as or safer than daylight operations from a collision avoidance perspective with proper aircraft lighting.”⁴ FAA currently permits kites and balloons to operate at night provided there is sufficient lighting to serve as an adequate warning to other aircraft. 14 C.F.R. 101.17(a).

⁴ New Mexico State University Unmanned Aircraft Systems Test Center recently completed a two-week study of sUAS operations at dusk and nighttime using the AeroVironment Raven B and Puma sUAS. A media statement dated September 25, 2014 states: “Preliminary analysis . . . indicated no degradation of safety when operating sUAS at night or dusk as compared to daytime operations.’ . . . The results are consistent with NMSU Physical Science Laboratory findings from 2012 that evaluated night operations of Raven A and WASP III sUAS.”

Accordingly, the Coalition urges the FAA to revise this section to allow the Administrator or his delegate to authorize nighttime operations, through exemption, deviation authority (certificate of waiver or authorization), or certification, upon a demonstration of a level of safety equivalent to daylight operations, in consideration of the technological capabilities of the sUAS – including any lighting equipment – the capability of the sUAS operator, the presence of one or more visual observers, the particular use scenario, and the operating environment, including the degree of illumination.

Section 107.31 – Visual line of sight operation

The Coalition supports the FAA's four proposed visual line of sight requirements for the sUAS operator, throughout the entire flight, to: (1) know the UAV's location; (2) determine the UAV's attitude, altitude, and direction; (3) observe the surrounding airspace for other air traffic or hazards; and (4) determine that the UAV does not endanger the life or property of another.

The Coalition also agrees with the FAA that a sUAS operator may be allowed "brief moments" when the operator loses sight of the small UAV, such as when it momentarily travels behind an obstruction, or to allow the operator to look at the control screen or scan the surrounding airspace for obstructions or obstacles. 80 Fed. Reg. at 9560.

The Coalition urges the FAA to revise this section to allow the Administrator or his delegate to authorize BVLOS operations, through deviation authority (Certificate of Waiver or Authorization) in consideration of the technological capabilities of the sUAS, the capability of the sUAS operator, the particular use scenario, and the operating environment.

Section 107.33 – Visual observer

The Coalition supports the FAA's determination that a visual observer is not required for operations of a sUAS within the visual line of sight of the operator. The FAA proposes to define "visual observer" in section 107.3 as "a person who assists the small unmanned aircraft operator to see and avoid other air traffic or objects aloft or on the ground." The Coalition does not object to this definition.

Whether a visual observer can be employed to perform responsibilities of the sUAS operator is uncertain. Compare "an operator must always be capable of seeing the small unmanned aircraft" with:

If the operation is augmented by at least one visual observer, the operator is not required to exercise this capability, as long as the visual observer maintains a constant visual line-of-sight of the small unmanned aircraft.

80 Fed. Reg. 9559. It appears that FAA will permit a visual observer to discharge the operator's see-and-avoid responsibility, so long as the observer and operator remain in constant communication and that the operator be capable of seeing the UAV. Yet, the "observer would not be permitted to manipulate any controls of the small UAS, share in operational control, or exercise any operation-related judgment independent of the operator." With these limitations, the Coalition does not see much benefit of using a visual observer.

The FAA notes that the line-of-sight requirement is satisfied if either the operator or the observer maintains an unenhanced visual line of sight of the small UAV.

Section 107.35 – Operation of multiple small unmanned aircraft systems

The Coalition does not oppose this limitation as a general presumption. However, with the advance of automation, we expect that a single sUAS operator will be able to program multiple small unmanned aircraft so they can be safely operated simultaneously.

The Coalition urges the FAA to revise this section to allow the Administrator or his delegate to authorize a sUAS operator to operate more than one sUAS at the same time, through certification of the additional capability by demonstrating the operator's ability, in tandem with the technological capabilities of the sUAS, to safely operate more than one sUAS at one time. This approach allows for consideration of the technological capabilities of the sUAS, the capability of the sUAS operator, the particular use scenario, and the operating environment.

Section 107.37 – Operation near aircraft, right-of-way rules

The Coalition supports the FAA's proposal to prohibit a sUAS operator from operating the UAV so close to another aircraft as to create a collision hazard, and to require the operator to see and avoid other aircraft and vehicles. The Coalition does not support the FAA's proposal to require the sUAS operator in all circumstances to yield to a manned aircraft. Because sUAS will not be permitted to operate over 500 AGL, and will be required to maintain a safe distance from the airfields and airspace necessary for takeoff and landing of manned aircraft, we agree that sUAS operators must yield in all cases to manned aircraft in the departure and approach of fixed-wing manned aircraft.

The Coalition also agrees that a sUAS operator should yield to "airborne vehicles, and launch and reentry vehicles," but expects the FAA to issue a NOTAM to apprise sUAS operators of the timing and location of a NASA or commercial space operation.

Operators of a sUAS should also be expected to yield to manned helicopter operations in furtherance of a public safety mission, such as medical evacuation or fire-fighting. However, there are other circumstances where more neutral right-of-way rules would be preferable rather than a categorical rule that a sUAS should always yield to a manned helicopter. Consider a newsworthy event that occurs at which a sUAS is being operated to film that event, perhaps for a television station, in uncontrolled airspace under 500 feet AGL. If a manned helicopter arrives on the scene 10 minutes later, the proposed rule would appear to require the sUAS to yield the right-of-way to the manned helicopter. We believe that safety would be served if both sUAS operator and manned helicopter operator "maintain awareness so as to see and avoid other aircraft." The Coalition seeks clarification of the FAA's proposed explanation of yielding the right-of-way: the sUAS operator "must give way to the other aircraft or vehicle and may not pass over, under, or ahead of it unless well clear." We believe this explanation would permit a sUAS operator to take precedence over a manned helicopter provided the UAV remain "well clear" of the manned helicopter.

We further believe that once UTM systems are in place, de-confliction and safe separation between sUAVs and manned helicopters should be readily achieved. Until that occurs, the Coalition recommends the FAA consider adapting the right-of-way rules in 14 C.F.R. 91.113 and 91.115 (over water) to the operation of small UAVs in the same airspace with manned helicopters.

Section 107.39 – Operations over people

The FAA proposes that no person may operate a small UAV over a human who is not “directly involved” in the sUAS operation or who is not located under a covered structure that can provide “reasonable protection” from a falling small UAV. The Coalition believes this proposal is unduly restrictive. The Coalition notes that there is no similar categorical provision governing manned aircraft. The safety of persons on the ground is achieved by requiring manned aircraft to remain at least 500 feet AGL and at least 1,000 feet over the highest obstacle if over a congested area or open assemble of persons. Over a remote or sparsely populated area, a manned aircraft must operate at least 500 feet from any person. See 14 C.F.R. 91.119.

In its suggestion of a micro UAS option, the FAA believes there is no undue safety risk with operating a micro UAS over people, with no apparent limit in the number of persons or the distance between the UAV and people. The key for the FAA is not only the light weight, and lower speed of the micro UAS, as well as its frangibility, but also because it must be operated within the visual line of sight of the operator, who has a see-and-avoid responsibility. The FAA proposes to apply these latter limitations also to sUAS other than micro UAS. Given the consequent reduction in risk, the Coalition believes that a small UAV may safely be operated over persons. Indeed, the FAA’s proposal would allow such operations, provided the persons are “directly involved” with the operation. The Coalition does not believe that the authority to operate over persons should turn solely on whether such persons are involved, directly or indirectly, with the operation.

A categorical prohibition would encompass the low-risk flight of a small UAV traversing a public square, a park, or a lake or river. Under the proposed section, using a sUAS to conduct news gathering might be prohibited or at least drastically compromised.

Consider also a search and rescue operation looking for a missing person. Part of the search is conducted on foot, and part of the search is conducted by one or more small unmanned aircraft. Would these UAVs be prohibited from flying over the persons on foot, because these persons would not be part of “the operation of the small unmanned aircraft”?

Also consider an insurance investigator or claims adjuster who desires to operate a sUAS to survey a neighborhood hit by a natural disaster, or a realtor who desires to perform aerial videography of homes in a neighborhood. In both cases, the sUAS operator puts out a notice to the affected homeowners, and perhaps even obtains their consent. In neither case would these homeowners be directly involved with the sUAS operation. The proposed section would not permit these operations.

Accordingly, the Coalition suggests proposed section 107.39 be revised to permit a small UAV to operate over one or more persons not directly involved with the operation for which a sUAS is

being used only where one of the following conditions is met: (1) the persons have been notified in advance of the sUAS operations; (2) the persons are reasonably protected from a falling UAV by a covered structure; (3) the sUAS operation is flown at least 100 feet above the persons and only for the purpose of transiting the airspace; or (4) as authorized by Air Traffic Control.

To address the news gathering setting, and to cover other potential operations, the Coalition also urges the FAA to revise this section to allow the Administrator or his delegate to authorize sUAS operations over non-participating persons, through exemption, deviation authority (certificate of waiver or authorization), or certification, upon a showing that any risk to persons on the ground is sufficiently mitigated. This approach allows for consideration of the technological capabilities of the sUAS, the capability of the sUAS operator, the presence of one or more visual observers, the particular use scenario, and the operating environment.

Section 107.41 – Operations in certain airspace

The Coalition supports the FAA's proposal to prohibit the operation of a sUAS in Class A airspace, which is airspace above 18,000 feet AGL. The Coalition notes that there may be sUAS models and operators that intend to operate a UAS at higher altitudes than Class A airspace (and thus must traverse that airspace), but recognizes that only sUAS operations within the visual line of sight of the operator are covered under proposed Part 107. As a general matter, the Coalition does not object to the FAA's proposal to require a sUAS operator that intends to operate in Class B, C, D airspace, or within the lateral boundaries of Class E airspace designated for an airport, to obtain prior authorization from the Air Traffic Control facility having jurisdiction over that airspace, but seeks clarification with respect to that authorization. We do not believe a sUAS operator must obtain a COA or that a NOTAM is necessary for certain limited operations in controlled airspace. We recommend that FAA agree to provide contact information for each ATC facility, and agree to provide timely decisions on whether to authorize such operations and under what terms and conditions.

Section 107.45 – Operations in prohibited or restricted areas

The Coalition supports the FAA's proposal to prohibit the operation of a sUAS in prohibited airspace or in restricted airspace, unless that person is authorized by the using or controlling agency. The Coalition points out that certain aerial photography, videography, survey and inspections can take place safely within restricted airspace, under certain limitations such as height and duration, and in particular where there may be adequate shielding of buildings. Thus, we recommend that, at least as to operations in restricted airspace, the FAA revise this section to explicitly reference the issuance of a COA and NOTAM as may be necessary.

Section 107.47 – Flight restrictions in the proximity of certain areas designated by notice to airmen

The Coalition generally supports the FAA's proposal to prohibit the operation of a sUAS in an area designated by a NOTAM issued under 14 C.F.R. 91.137 through 91.145 unless authorized by Air Traffic Control or a Certificate of Waiver of Authorization ("COA"). The Coalition envisions that operators of small UASs may wish to operate over major sporting events, either for news gathering or under contract with a sponsor of the sporting event, and that under

proposed section 107.47(a), such operations may be conducted safely with appropriate authority with Air Traffic Control. Section 91.145 contemplates that the FAA will issue a NOTAM authorizing certain operations during major sporting events. The Coalition seeks clarification that NOTAMs issued for sporting events will authorize sUAS operations, provided, of course that such operations maintain the safety of airspace and persons on the ground. See the Coalition's comments above on proposed section 107.39.

Section 107.49 – Preflight familiarization, inspection, and actions for aircraft operation

The Coalition supports the FAA's proposed preflight inspection and related requirements, namely that the operator: (1) assess the operating environment, (2) conduct a briefing of all those involved in the operation, (3) ensure all communications links are working properly, and (4) ensure that the battery or power is sufficient for the intended operational time plus five minutes.

Section 107.51 – Operating limitations for small unmanned aircraft

The FAA proposes four operating limitations. The Coalition supports the 100 mph (87 knot) maximum speed limit. As a general matter, the Coalition also supports the 500 feet AGL limit. However, we believe a sUAS operator should be able to obtain permission from the FAA to operate above this altitude in certain limited circumstances, where, for example, manned aircraft cannot safely operate. A small UAV that is intended to inspect a skyscraper in an urban setting may need to operate at an altitude higher than 500 feet AGL. There may be other reasons to operate a small UAV at higher altitudes, whether in controlled or uncontrolled airspace. We recommend that this limitation be revised to allow for operations over 500 feet AGL but only with the permission of the appropriate ATC facility.

The Coalition does not agree with the FAA's proposal in subsection (c) to require three miles (5 km) of visibility in all circumstances. Many if not most sUAS operations under proposed Part 107 will be much less than three miles in distance. It makes no sense to prohibit the inspection of roofs, bridges, cell towers, and flare stacks or to prohibit aerial photography, videography, and cinematography where those operations are within a mile of, or closer to, the ground station, simply because the visibility does not extend to three miles. The Coalition recommends this proposed section be revised so that a sUAS operator may conduct an operation with less than 3 miles visibility where the concept of operations allows for adequate time to enable the UAV to say clear of any traffic and to execute avoidance procedures if needed.

The Coalition also does not agree with the FAA's proposal in subsection (d) to require that any sUAS operation must be at least 500 feet below a cloud and at least 2,000 feet horizontally away from a cloud. These limits are adapted from the Basic VFR weather minimums in 14 C.F.R. 91.155 for manned aircraft in Class G airspace. However, section 91.155(b)(1) permits helicopter operations "clear of clouds if operated at a speed that allows the pilot adequate opportunity to see any air traffic or obstruction in order to avoid a collision." We urge the FAA to adopt such a functional test in place of its proposed distance limits.

Part 107 – Subpart C – Operator Certification

Section 107.53 – Applicability

The Coalition notes that this section contains no requirements.

Section 107.57 – Offenses involving alcohol or drugs

The Coalition supports this proposal.

Section 107.59 – Refusal to submit to an alcohol test or to furnish test results

The Coalition supports this proposal.

Section 107.61 – Eligibility

The Coalition does not object to the FAA's proposal to require a sUAS operator to: (1) be at least 17 years of age; (2) to read, speak, write, and understand English; (3) pass an initial aeronautical knowledge test; and (4) have no reason to know that the operator has a physical or mental condition that would interfere with operating the sUAS safely.

Section 107.63 – Issuance of an unmanned aircraft operator certificate with a small UAS rating

The Coalition generally supports the FAA's proposed application requirements and procedures. In particular, the Coalition supports proposed subsection (b) that would authorize a Designated Pilot Examiner, an airman certification representative for a pilot school, a certified flight instructor (which could be a flight instructor employed by the company in which the operator works), or any other person authorized by the Administrator, to accept an application. We believe each of these persons should also be authorized to conduct the aeronautical knowledge test and issue unmanned aircraft operator certificates with small UAS rating.

The Coalition further believes that aeronautical knowledge testing should be permitted to be conducted and completed online.

Section 107.65 – Aeronautical knowledge recency

The Coalition supports the FAA's proposal that a sUAS operator must have successfully completed either an initial or recurrent aeronautical knowledge test within the previous 24 months. We believe that a two-year period is an appropriate duration for initial and renewed certification. At a minimum, recurrent testing should be permitted to be accomplished online.

Section 107.67 – Knowledge tests: General procedures and passing grades

The Coalition supports the FAA's proposed testing procedures in terms of the information requirements in proposed subsection (b). With respect to the proposal that the times, places and instructors be designated by the Administrator, the Coalition notes that in the preamble to the proposed rule, the FAA indicates that there are over 650 knowledge testing centers in the United

States for manned aircraft pilots, and that these facilities would also function as aeronautical knowledge test centers. 80 Fed. Reg. at 9570. We also suggest the FAA establish an online testing procedure.

Section 107.69 – Knowledge tests: Cheating or other unauthorized conduct

The Coalition supports the FAA’s proposal to prohibit and to punish cheating in connection with the aeronautical knowledge test.

Section 107.71 – Retesting after failure

The Coalition does not oppose the FAA’s proposal to require a 14-day waiting period before a person who fails an aeronautical knowledge test reapplies.

Section 107.73 – Initial and recurrent knowledge tests

The Coalition supports the FAA’s proposed requirement elements for the initial and recurrent aeronautical knowledge test. However, we recommend this provision be revised to allow the required scope and degree of aeronautical knowledge be scaled to the particular nature of the operations for which the operator seeks a certificate. For example, two of the proposed required elements, crew resource management and airport operations, may have little or no relevance for certain sUAS operations.

Section 107.75 – Military pilots or former military pilots

The Coalition supports the FAA’s proposal to streamline the process of granting an unmanned aircraft operator certificate with sUAS rating for current and former U.S. military unmanned aircraft pilot or operator.

Section 107.77 – Change of name or address

The Coalition supports the FAA’s proposed procedures governing a change of name or address.

Section 107.79 – Voluntary surrender of certificate

The Coalition supports the FAA’s proposal that the holder of a sUAS operator certificate may voluntarily surrender that certificate.

Part 107 – Subpart D – Small Unmanned Aircraft Registration and Identification

Section 107.87 – Applicability

The Coalition notes that this section contains no requirements.

Section 107.89 – Registration and identification

While perhaps outside the scope of this rulemaking, the Coalition urges the FAA to establish an electronic UAS registration database, similar to the International Registry established by the Cape Town Convention. Such a database would provide all of the relevant information to the FAA, TSA, or the public, but would avoid the paperwork exercise and delay in obtaining an aircraft registration certificate.

The FAA proposes to subject sUAS operators to the aircraft registration and identification requirements in Parts 47 and 45, respectively, governing manned aircraft. The Coalition supports a requirement that each small UAV operated under Part 107 should be registered.

With respect to the registration of foreign-owned UAVs, the FAA explains that under section 44103 of the Federal Aviation Act, a foreign-owned aircraft may be registered in the United States if the aircraft is owned by a permanent resident or by a non-U.S. citizen corporation that is organized and doing business in the United States and the aircraft is based and primarily used in the United States. 80 Fed. Reg. at 9554. The current statute should cover many small UAVs that may be owned by non-U.S. citizens. The FAA also notes that international trade obligations permit foreign-owned aircraft to conduct “specialty air services” in the United States. These services include aerial mapping, surveying, aerial photography, aerial advertising, aerial inspection and surveillance; in short, any activity of an aircraft whose primary purpose is not the transportation of goods. The Coalition endorses this approach, and urges the Administration to authorize the operation of specialty air services by foreign-owned small UAVs in the United States.

The Coalition supports the FAA’s proposal to exempt sUAS from the requirements of 14 C.F.R. 47.15, 80 Fed. Reg. at 9574, which we believe from the context of the FAA’s discussion may be limited to subsection (a) of section 47.15. That subsection addresses aircraft not previously registered anywhere, and the FAA believes sUAS operators should be relieved of the requirement to show evidence that the aircraft has never been registered in a foreign country.

The Coalition also requests that FAA confirm that an sUAS owner who submits a receipt from a retail store at which the owner purchased the sUAS complies with the evidence-of-ownership requirements under current section 47.33.

The FAA believes that its current requirement to display the N-number on the aircraft is flexible enough to be adjusted for small UAVs. The Coalition agrees with the FAA that it would not be cost-effective to apply the product marking requirements of Subpart B of Part 45 to small UAVs.

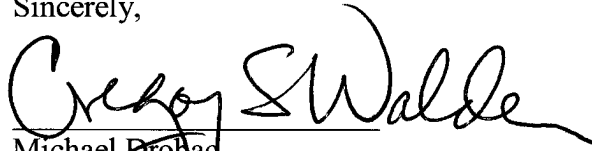
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The Coalition supports the FAA’s proposal that Designate Pilot Examiners (DPEs) be authorized to “accept” an application for an unmanned aircraft operator certificate with small UAS rating, with the understanding that the DPEs are authorized to issue such a certificate under the Administrator’s designation.

April 22, 2015

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Sincerely,

A handwritten signature in black ink, reading "Gregory S. Walden". The signature is written in a cursive style with a large, looping "G" and a long, sweeping "W".

Michael Drobac

Jennifer Richter

Gregory S. Walden

Akin Gump Strauss Hauer & Feld

For The Small UAV Coalition

Copy to:

Honorable Anthony Foxx

Secretary of Transportation