

**BEFORE THE
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, D.C.**

IN THE MATTER OF

Petition of Advanced Aviation Solutions LLC for Exemption

Docket Number: FAA-2014-0508

COMMENTS OF THE SMALL UAV COALITION

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Introduction

The Small UAV Coalition¹ is pleased to provide its comments in support of the petition for exemption submitted by Advanced Aviation Solutions LLC (“ADAVSO”) under section 333 of the FAA Modernization and Reform Act of 2012 (“the Act”). ADAVSO proposes to operate the eBee Ag unmanned aircraft vehicle and system (“UAV” and “UAS”) manufactured by SenseFly SA of Switzerland Inc., to perform precision agriculture. Members of the Small UAV Coalition share an interest in advancing regulatory and policy changes that will permit the operation of small UAVs in the near term, beyond the line of sight, with varying degrees of autonomy, for commercial, consumer, recreational and philanthropic purposes. Coalition members are concerned that the current pace of regulatory and policy development, particularly in the U.S. but also in some other countries, has impeded and will impede small UAV development, services, and benefits for consumers. We encourage the Federal Aviation Administration (“FAA”) to establish, as soon as possible, a regulatory environment for small UAVs, such as ADAVSO’s, that will foster safe experimentation and innovation so that globally important development work and operations can occur here in the U.S.

Although the focus of these comments is the ADAVSO petition, the Coalition recognizes that UAV policy in the U.S. may have ramifications worldwide. There are many UAV manufacturers outside of the U.S. who are or soon will be ready to market their products and services in the U.S., and many U.S. corporations have expanded their small UAV development activities

¹ Members of the Small UAV Coalition include 3D Robotics, AirWare, Amazon Prime Air, DJI Innovations, GoPro, and Parrot. SenseFly SA is subsidiary of Parrot.

overseas. Moreover, other countries may follow or adopt U.S. regulations or policies for their domestic UAV operations. It should be a U.S. policy imperative, therefore, to foster innovative technologies that promise consumer and public benefits, while addressing safety, as soon as possible. The FAA should work expeditiously to implement its section 333 authority with these policy considerations in mind. The Small UAV Coalition seeks to work with the FAA to expedite testing and operation of small UAVs in the United States. Reasonable regulations, waivers and exemptions, with safety, security, and privacy as their foundation, will encourage the growing domestic and international opportunities.

Clarity and clear guidelines are needed from the FAA for development and operation of small UAVs, whether those UAVs are used for recreational or commercial purposes. Because of their size, weight, speed, and the altitude at which they will typically operate, small UAVs such as the ones to be operated by ADAVSO pose considerably less safety risk than larger UAVs, such as UAVs that are used for defense and other aerospace purposes. The Small UAV Coalition urges the FAA to adopt an evaluation framework for UAV operations under section 333 that weighs the relative safety issues and risks of UAVs by class, rather than adopting artificial distinctions among UAVs based upon commercial and non-commercial operations.

The ADAVSO Petition

As noted above, ADAVSO's petition seeks FAA permission to conduct precision agriculture including photogrammetry and crop scouting. Although ADAVSO's proposed small UAV operations may pose no greater risk than small UAVs that are used by hobbyists and modelers (because of weight, altitude, etc.), ADAVSO has proposed to abide by much stronger safety measures than are required for these groups. The Small UAV Coalition does not believe that heightened safety measures should be required for ADAVSO simply because of the commercial nature of its operations. Small UAVs that operate for any purpose, commercial or non-commercial, should be judged based upon the precautions taken for safe operation, taking into consideration the relevant technical parameters of the UAV and UAS.

The eBee Ag system ADAVSO proposes to operate consists of an electric-powered 1.5 pound UAV (constructed primarily out of flexible foam), an onboard geo-referenced still camera, a PC-based ground control station, and communications equipment. ADAVSO will operate the UAV within the visual line of sight (no greater than one-half nautical mile) of the pilot in command, in Class G airspace not to exceed 400 feet AGL, both parameters pre-programmed by GPS geofencing. All flights will be operated over private property with the prior consent of the property owner(s). The UAV's capability to hover, and move vertically and horizontally are programmed per eMotion, flight management software that enables the operator to program an operation and then monitor it in real time. The eBee Ag has an override capability that allows the operator to operate the UAV manually at any time during the flight, should it be necessary to respond to emergent circumstances, with Go to Home, Go Land, and Hold and Resume the mission commands. ADAVSO pilots will complete FAA commercial pilot ground instruction and pass the FAA commercial pilot written exam in addition to completing private pilot requirements. ADAVSO will also position a visual observer within the voice distance of the pilot in command.

The Small UAV Coalition offers the following comments in support of the ADAVSO petition:

Consistent with Section 333, the FAA should authorize UAV operations for ADAVSO in the near term, including in advance of the small UAV rulemaking.

In section 333 of the Act, Congress directed the FAA to determine if certain UAV operations may be authorized even in advance of the completion of the small UAV rulemaking mandated in section 332 if operations will not “create a hazard to users of the national airspace system or the public or pose a threat to national security.”² The Small UAV Coalition believes the FAA should grant ADAVSO’s petition under Section 333 because ADAVSO proposes to operate its small UAVs only on private property with many safety precautions.

Section 333 is best understood in conjunction with the mandated small UAV rulemaking under section 332.³ Congress directed the FAA, under section 332, to publish a final small UAV rule by August 2014. In contrast, Congress directed the FAA, under section 333, to determine by August 2013 whether certain unmanned aircraft systems may be operated safely even before completion of the section 332 rulemaking. Although neither deadline was met, we believe it is imperative that the FAA continue to push forward with both initiatives, expeditiously processing and approving petitions filed under section 333, such as the ADAVSO petition. The clear intent of Congress was to direct the FAA to authorize certain UAV operations on an expedited basis, including in advance of completing the rulemaking.⁴ ADAVSO has made a strong showing justifying grant of the requested authority.

² Section 333 states in relevant part:

(a) **IN GENERAL.**— Notwithstanding any other requirement of this subtitle, and not later than 180 days after the date of enactment of this Act, the Secretary of Transportation shall determine if certain unmanned aircraft systems may operate safely in the national airspace system before completion of the plan and rulemaking required by section 332 of this Act[.]

(b) **ASSESSMENT OF UNMANNED AIRCRAFT SYSTEMS**— In making the determination under subsection (a), the Secretary shall determine, at a minimum—

(1) which types of unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, 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; and

(2) whether a certificate of waiver, certificate of authorization, or airworthiness certification under section 44704 of title 49, United States Code, is required for the operation of unmanned aircraft systems identified under paragraph (1).

(c) **REQUIREMENTS FOR SAFE OPERATION.** — If the Secretary determines under this section that certain unmanned aircraft systems may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft systems in the national airspace system.

³ There is no pertinent legislative history that sheds any light on the meaning of this provision.

⁴ In section 332(b)(1), Congress directed the publication of a rule for small unmanned aircraft systems “to the extent the systems do not meet the requirements for expedited operational authorization under section 333 of this Act.” Congress clearly intended for the FAA to proceed expeditiously to authorize safe operation and experimentation of small UAVs.

Section 333 directs the FAA to authorize UAV operations that may safely operate in the national airspace system; ADAVSO's petition demonstrates safe operations.

Congress gave the FAA authority to determine whether certain unmanned aircraft systems may be operated safely in the national airspace system,⁵ and listed in section 333 seven factors for the FAA to consider. The FAA is to consider operational risks and steps that can be taken to eliminate or reduce such risks. In the view of the Small UAV Coalition, risk should be the touchstone for any and all FAA rules, waivers, and exemptions governing UAVs.

We recognize that, in implementing the Federal Aviation Act as Congress directed, the FAA historically has imposed greater requirements on commercial operators than on general aviation. However, those requirements derive from a legitimate public concern over passenger safety on manned aircraft that serve as common carriers for public transportation, and do not apply to operation of small unmanned aircraft, such as the UAV operations proposed by ADAVSO.

Unlike the model aircraft concept defined in section 336, the FAA's safety evaluation of UAV operations does not hinge on whether the operation is public, commercial, recreational or philanthropic.⁶

Finally, the Small UAV Coalition wishes to respond to comments filed by the Air Line Pilots Association ("ALPA") in other section 333 exemption dockets, in which ALPA argues that all aircraft, manned and unmanned, in the National Airspace System ("NAS") "must operate to the same high level of safety." This position is at odds with the explicit direction by Congress in the Federal Aviation Act,⁷ that the FAA promulgate safety regulations considering "(A) the duty of an air carrier to provide service with the highest possible degree of safety in the public interest, and (B) differences between air transportation and other air commerce." Requirements imposed on common carriers for air transportation under Parts 121 and 135 are much more stringent than requirements imposed on general aviation under Part 91. Certainly requirements may differ depending on whether a UAV will be operating in Class A or Class G airspace. Manned aircraft are currently subject to different requirements based on the airspace in which they are operated. Here, ADAVSO proposes to operate its UAVs below 400 feet AGL, on private property with the consent of the owner(s). These precautions are more than adequate to ensure safe operations by ADAVSO.

While the Coalition is committed to ensuring the safety of small UAV and UAS operations in the National Airspace System, we believe FAA safety regulations should be proportionate to the risks posed by the particular UAV operations proposed, distinguishing small UAVs from other

⁵ Subsections 333(a) and (c) provide that safety in the national airspace system is the ultimate consideration.

⁶ Although Congress in section 336 limited the special rule for model aircraft to aircraft "flown for hobby or recreational purposes," the FAA need not and should not apply a commercial/non-commercial distinction in its small UAV rulemaking under section 332 or when considering petitions for exemption and other requests under section 333. All regulations and policies with respect to small UAVs should be safety and risk-based, taking into consideration size, weight, speed, altitude, etc., and this approach should be taken in evaluating ADAVSO's petition.

⁷ 49 U.S.C. 44701(d) and 44702(b).

UAVs. Small UAV operations, such as those proposed by ADAVSO, pose minimal risks to safety and should, therefore, be subject to minimal and appropriate regulations.

When evaluating the ADAVSO petition, the FAA should consider the seven factors Congress directed the FAA to consider, but the FAA should recognize that this list is not exhaustive or requisite.

As ADAVSO's petition shows, factors other than the seven factors set forth by Congress in section 333 are relevant. In section 333, Congress directed the FAA to consider the following when making section 333 determinations: size, weight, speed, operational capability, proximity to airports, proximity to populated areas, and operation within visual line of sight. But in the words immediately preceding this list, Congress stated that the FAA is to consider these factors "at a minimum." The FAA may consider additional relevant factors not enumerated in section 333, including some factors that are addressed in ADAVSO's petition, such as: location, the altitude of its small UAV operations, and pilot training and experience.

Each of the seven identified factors identified by Congress is potentially relevant to the FAA's safety risk determination, but not all of these factors are a prerequisite for every exemption. In particular, the FAA cannot interpret section 333 as prohibiting operations beyond the visual line of sight in every case. If Congress intended any factor to be a requirement, it would have mandated such restrictions by law.

It is incumbent on the FAA to evaluate each factor within the context of the applicant's proposed UAV operations. Consider the factor of weight. Congress did not provide a weight (or size) limit for model aircraft, and provided that a small UAV (for purposes of the small UAV rulemaking under section 332) could weigh up to 55 pounds (section 331(6)). Congress did not provide a weight (or size) limit in section 333. Whether the weight of the aircraft poses an undue safety risk will depend on the facts and circumstances of the particular UAV operations: altitude of operation, airspace for operation, and geographic area. In ADAVSO's case, the weight of its small UAV is extremely lightweight, less than 2 pounds. Considering the altitude and area in which its small UAVs will be operated, on private property with the consent of property owners, ADAVSO's UAV operations will pose no safety risk to other aircraft, national security, or persons on the ground.

Other factors the FAA may consider include speed and proximity of UAV operations to airports and populated areas. With respect to speed, the relevance of this factor depends on the facts and circumstances of the particular UAV operations. The speed of a UAV operating in the same airspace as commercial aircraft operations is a legitimate safety factor. However, the speed of a UAV operating below 400 feet AGL should be evaluated with respect to safely maneuvering, detecting and avoiding. The speed at which ADAVSO will operate the eBee Ag UAV is not stated in the petition, but the operations covered by this petition will take place below 400 feet AGL, within the visual line of sight, and confined to private property. Thus, these operations do not create any safety risk that is not more than adequately mitigated.

The proximity of UAV operations to airports and populated areas are also relevant factors. There are over 19,000 airfields in the United States; of these, only 5,000 or so are public use airfields. Over 3,000 airports are listed in the National Plan of Integrated Airport Systems, but

only 500 of these have commercial service. The safety risk of a UAV operating close to an airfield that is not public is appreciably less (and easily managed) compared with UAVs operating proximate to commercial service airports such as John F. Kennedy International Airport or Chicago O'Hare International Airport. ADAVSO states that will operate its UAVs at least 5 miles from an airport or heliport.

The risk of UAV operations that are close to populated areas is highly dependent on the specific facts and circumstances. Congress did not define "populated area" and it is not apparent that this concept is the same as or similar to the concept of "congested area" in 14 C.F.R. 91.119. Similar to the concept of shielding (used in determining electromagnetic interference), tall buildings or structures between airports or populated areas and the proposed small UAV operation may allow a small UAV to operate without a safety risk, despite the operation's proximity to either. There is often a congregation of people present on a closed set where a UAV will be used for filming; however, the UAV may be operated safely nearby or inside a populated area. ADAVSO states that it will not operate its UAVs over urban or populated areas or over heavily trafficked roads.

Finally, Congress also directed the FAA to consider operational capability of the UAV. The eBee Ag UAV is programmed to be operated within the line of sight and under 400 feet AGL, as well as to proceed safely to a predetermined location or land in an emergency.

We believe the relevant factors for the FAA's UAV evaluation, whether or not identified in section 333, should be viewed through the lens of the particular UAV operations that are proposed in each petition, including ADAVSO's petition. In considering whether to authorize UAV operations, the FAA should evaluate and balance these factors using safety and security as cornerstones, not rigidly adhere to a list of factors that may or may not be relevant or important to particular UAV operations. In the view of the Small UAV Coalition, there should be no question that ADAVSO's proposed operations satisfy the seven factors set forth by Congress and several additional mitigating factors that will ensure the safety and security of ADAVSO's proposed small UAV operations.

Section 333 permits the FAA to authorize UAV operations without type, production, or airworthiness certification; ADAVSO has demonstrated that no such certification is necessary.

Congress expressly vested in the FAA authority to determine the substantive safety requirements to impose on UAV operations under section 333. Congress also left to the FAA the question of how authorizations would be granted pursuant to section 333. It tasked the FAA with determining *whether* a certificate of waiver, certificate of authorization or airworthiness certification under 49 U.S.C. 44704 should be required.

ADAVSO's petition, similar to other petitions, seeks an exemption from the airworthiness certification regulation.⁸ ADAVSO requests the issuance of an experimental category certificate of airworthiness, assuming that commercial precision agriculture operations fit within this category, stating that market surveys, sales demonstrations and customer crew training operations are permitted with an experimental category airworthiness certificate. ADAVSO adds

⁸ 14 C.F.R. Part 21.

that if an experimental category certificate is not appropriate, it seeks an exemption from Part 21, Subpart H, which would cover restricted category aircraft, which would appear to more closely fit the nature of ADAVSO's proposed operations. Restricted category aircraft are so named because the FAA certifies aircraft for a special purpose operation, such as agricultural, aerial surveying, patrolling of pipelines and power lines, aerial advertising, and "any other operation specified by the FAA."⁹ We agree that an exemption from the airworthiness certification requirements is warranted. The type, production, and airworthiness certification processes are unnecessary if the FAA and the UAV operator agree on certain operational limitations to ensure safety (similar to limitations on an airworthiness certificate). The operational limitations proposed by ADAVSO should be more than adequate to grant an exemption from the airworthiness certification regulation. Furthermore, we note that similar small UAV operations, conducted by hobbyists and modelers, are appropriately permitted without such certification.

ADAVSO states that its pilots will complete FAA commercial pilot ground instruction and pass the FAA commercial pilot written exam in addition to completing private pilot requirements. ADAVSO also proposes that, in place of obtaining a medical certificate, its pilots be required to have corrected vision to 20/20 and a valid, State-issued driver's license. As a general matter, the Small UAV Coalition does not believe that traditional pilot certification requirements for manned aircraft are necessary or appropriate for operators of small unmanned aircraft. Although the requirement for a pilot to hold an airman certificate is statutory, section 333 of the Act instructs the FAA to consider whether to require, waive, or exempt the enumerated certificates "at a minimum." The FAA should waive or exempt the pilot certification requirement with respect to small UAS operators under section 333 as well as under its general waiver/exemption authority in the Federal Aviation Act.¹⁰ The manifold innovative UAV technologies, particularly for small UAVs, should not be subject to a one-size-fits-all paradigm with respect to pilot certification. Applying manned aircraft pilot certification requirements to small unmanned aircraft is not necessary as a matter of safety, and does not make sense as a matter of public policy.

Section 333 permits the FAA to use any administrative process to authorize UAV operations.

Congress also left to the FAA the question of how the substantive safety requirements under section 333 would be imposed. Congress provided no guidance other than to expedite operational authorizations, including in advance of completing the small UAV rulemaking under section 332. ADAVSO's petition for exemption is one of over 30 petitions docketed since the FAA invited entities to submit petitions.

Although the FAA may use its Part 11 exemption process to authorize UAV operations under section 333, the FAA also has broad authority under the Federal Aviation Act to grant an exemption from any safety regulation "if the Administrator finds the exemption in the public interest."¹¹ In evaluating ADAVSO's petition and other petitions filed under section 333, it may be more appropriate to assess the safety impact, if any, of the particular small unmanned aircraft

⁹ 14 C.F.R. 21.25(b).

¹⁰ 49 U.S.C. 44701(f).

¹¹ 49 U.S.C. 44701(f).

operations that are proposed, rather than to engage in a comparison with Federal Aviation Regulations adopted with manned aircraft in mind.

We encourage the FAA, in granting an exemption petition under section 333, to advise the public, where it is appropriate, that a subsequent petition requesting the same relief under the same material facts will be granted. For the FAA's own administrative convenience, and for the benefit of small UAV innovation, the FAA can and should make public interest and safety determinations more broadly than in case-by-case exemption proceedings. Three illustrations, among many others, may be found in section 333 petitions for exemption filed to date, including ADAVSO's. For example, the Federal Aviation Regulations require that the approved Airplane Flight Manual, the aircraft registration certificate, and the aircraft airworthiness certificate be carried on board the aircraft.¹² For all small UAVs, regardless of the nature of their operations, these requirements are impractical and may be remedied simply by ensuring these documents are maintained in the UAV operator's identified ground station. Consistent with the intent of section 333, the FAA can impose this requirement across the board. Congress directed the FAA in section 333 to determine which "types of operations" may be conducted safely in the national airspace system; thus, Congress contemplated the making of generally applicable safety determinations apart from and in advance of the small UAV rulemaking.

Section 333 authority does not expire on the publication of a small UAV rule.

Congress directed the FAA, under section 333, to determine whether certain unmanned aircraft systems may be operated safely even before completion of the section 332 rulemaking. However, section 333 is not temporary authority which expires with the publication of a final small UAV rule. There is no "sunset" provision. If Congress had intended section 333 authorizations to expire, or that the FAA would no longer entertain petitions for exemption after publication of a final rule, it would have included such a provision. For instance, Congress included a sunset provision for its pilot program for passenger facility fee authorizations at non-hub airports.¹³ Congress inserted sunset triggers in connection with age standards for pilots operating certain types of flights.¹⁴ A view that section 333 authorizations must expire or be superseded by the small UAV rule is unsupported by the statutory text. There is no basis to opine that UAV operations under section 333 and upcoming small UAV rules will not exist in parallel. Rather, section 333 gives the FAA the necessary flexibility to grant case-by-case authority and foster the development of the U.S. UAV industry.

The small UAV rulemaking will benefit from safety determinations made by the FAA under section 333, including making a positive decision on ADAVSO's petition in the near term.

The Small UAV Coalition believes the FAA should adopt and propose some of the precedents it sets in granting section 333 petitions as part of the small UAV Notice of Proposed Rulemaking, provided that it exercises proportionality, taking into account specific classes of UAVs, such as the particular characteristics of small UAVs. As we have made clear, the Small UAV Coalition firmly believes that operators will employ different technologies and standards commensurate with the

¹² 14 C.F.R. 91.9(b), 91.203(a) and (b).

¹³ 49 U.S.C. § 40117(1)(7).

¹⁴ 49 U.S.C. 44729(c)(2) & (d).

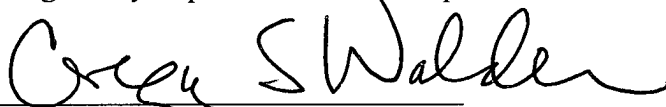
particular capabilities of the UAS and the particular capabilities of the UAV operations. It may be that some technologies and protocols may be generally applicable, but others should be tailored to specific classes of UAV/UAS technology. We encourage the FAA to adopt the broadest and most flexible approaches at this stage to ensure continued innovation of technology and standards that will allow for safe small UAV operations across a myriad of small UAV/UAS technologies and applications.

We also believe that the experience the FAA and the UAV industry gain from UAV operations authorized under section 333, as well as the experience gained at FAA test sites and elsewhere, can improve and accelerate the rulemaking process. Allowing ADAVSO and other petitioners to begin near-term operations under section 333, with appropriate conditions and limitations, will provide innovators the necessary physical and regulatory space to pioneer technologies and develop viable business models. This experience and knowledge also will allow the FAA to develop the optimal regulatory framework that both promotes safety and supports growth of a very promising industry by allowing the FAA to learn from operations pursuant to section 333 authority and incorporate insights and lessons learned into the regulatory framework. All of this will allow manufacturers, operators and other interested parties to effectively participate in the rulemaking process with real-world data, observations and analysis.

Conclusion

ADAVSO's petition demonstrates that its small UAS operations can be conducted safely on private property, with a number of voluntary safety precautions. In the view of the Small UAV Coalition, the FAA should expeditiously grant ADAVSO authority under section 333. The Small UAV Coalition is pleased to support this petition and to recommend that the FAA apply section 333 flexibly in this case. The Small UAV Coalition believes that ADAVSO's operations will provide a valuable opportunity for the FAA to advance the Congressional goal of permitting small UAVs to fly commercially in the U.S. safely and in the near future.

We believe the relevant factors for the FAA's evaluation of the ADAVSO petition – including several factors we have identified that are not enumerated in section 333 – all support a grant of the ADAVSO petition. In considering whether to authorize UAV operations such as ADAVSO's, the FAA should evaluate and balance these factors using safety and security as cornerstones. The Small UAV Coalition hopes that the FAA will create a regulatory environment for UAVs that will foster safe and innovative experimentation and operations for companies such as ADAVSO, so that globally important UAV development work can occur in the United States.



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