

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

IN THE MATTER OF

Petition of MicroCopter Professional Services Inc. for Exemption

Docket Number: FAA-2014-0557

COMMENTS OF THE SMALL UAV COALITION

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September 29, 2014

Filed with www.regulations.gov

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Introduction

The Small UAV Coalition¹ is pleased to provide its comments in support of the petition for exemption submitted by MicroCopter Professional Services Inc. (“MicroCopter Pro”) under section 333 of the FAA Modernization and Reform Act of 2012 (“the Act”). MicroCopter Pro proposes to operate one of more small unmanned aircraft vehicle and systems (“UAV” and “UAS”) to conduct a variety of commercial services, including aerial photography, aerial surveying, infrastructure inspection, inspection of residential and commercial properties, search and rescue and reconnaissance in disasters and other emergencies. 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, within and beyond the line of sight, with varying degrees of autonomy, for commercial, consumer, recreational and philanthropic purposes. Coalition members are concerned with the current pace of regulatory and policy development, particularly in the U.S. but also in other countries, that has impeded and will continue to 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 MicroCopter Pro’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 MicroCopter Pro petition, the Coalition recognizes that UAV policy in the U.S. may have ramifications worldwide. There are many UAV

¹ Members of the Small UAV Coalition include 3D Robotics, Airware, Amazon Prime Air, DJI Innovations, Google, GoPro, and Parrot.

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 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 UAV technologies that promise consumer and public benefits, as soon as safely 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 domestic and international UAV opportunities.

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 MicroCopter Pro pose considerably less safety risk than larger UAVs. 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.

The MicroCopter Pro Petition

As noted above, MicroCopter Pro's petition seeks FAA permission to conduct a variety of commercial services. Although MicroCopter Pro'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.), MicroCopter Pro 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 MicroCopter Pro 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.

MicroCopter Pro proposes to operate a battery-operated UAV no heavier than 25 lbs., including payload, within the visual line of sight of the pilot in command, and below 400 feet AGL. The UAVs will be equipped with propellers and manufactured with flexible non-metal material capable of breaking up upon impact with other objects. Flights will be operated outside of 5 miles from any airport or heliport unless Air Traffic Control has been notified and authorized the UAV operation. Total flight time will be 30 minutes; maximum flight time for each flight will be limited to the amount of time the UAV may be flown and still maintain a reserve battery power of not less than 20%. The UAV flight system will be supported by GPS and a Safe Return mechanism so that the UAV will return to the take-off location autonomously within a Safety Perimeter determined before flight by the PIC where the possibility of contact with persons, vehicles, or other dangers will be "minimal or non-existent." When the UAV including payload exceeds 15 pounds that UAV "will use a system of parachute activated by Radio Control" (Mars Parachute for UAV's) to avoid or minimize any damages during an accident. The petition does not address the qualifications or training of the PIC or observers other than to state that they will hold second class medical certificates. (Pilot qualifications may be addressed in one of the documents MicroCopter Pro filed submitted to the FAA on a confidential basis.) The PIC will undertake a preflight inspection of the UAV to confirm its airworthiness.

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

Consistent with Section 333, the FAA should authorize UAV operations for MicroCopter Pro 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

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 MicroCopter Pro 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 MicroCopter Pro 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; MicroCopter Pro'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 MicroCopter Pro.

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, MicroCopter Pro proposes to operate its UAVs below 400 feet AGL within the visual line of sight and a safety perimeter. These precautions are more than adequate to ensure safe operations by MicroCopter Pro.

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 MicroCopter Pro's petition.

⁷ 49 U.S.C. 44701(d) and 44702(b).

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

When evaluating the MicroCopter Pro 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 MicroCopter Pro'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 MicroCopter Pro's petition, such as: location and the altitude of its small UAV operations.

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 its recent grant of exemptions to Astraeus Aerial and other petitioners, the FAA has determined that operating within the visual line of sight is a statutory mandate under section 333. We disagree. If Congress intended any factor in section 333 to be a requirement, it would have mandated such restrictions by law, as it did in section 336 (with respect to model aircraft) and section 334 (with respect to certain public agency operations). While relevant in evaluating safety risks, FAA should not interpret section 333 as prohibiting operations beyond the visual line of sight in every case.

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 MicroCopter Pro's case, the weight of its small UAV, with payload, will be under 25 pounds. Considering the altitude and areas in which its small UAVs will be operated, and other precautions to be taken, MicroCopter Pro's UAV operations are unlikely to pose a 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. MicroCopter Pro's small UAVs will not exceed 50 knots, and the operations covered by this petition will take place below 400 feet AGL, within the visual line of sight of the pilot. In the exemption petitions granted September 25, the FAA imposed a ground

speed of 50 knots as a condition of the exemption. 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.

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. Flights will be operated outside of 5 miles from any airport or heliport unless Air Traffic Control has been notified and authorized the UAV operation. MicroCopter also states that its UAVs will be operated only within a safety perimeter defined by the PIC to minimize the possibility of contact with persons not involved in the UAV operation. Under these circumstances, MicroCopter Pro's operations do not pose a risk to any congested area or populated area.

Finally, Congress also directed the FAA to consider operational capability of the UAV. The UAV(s) to be operated by MicroCopter Pro will safely return to a predetermined location within the safety perimeter area if the communications link or GPS signal is lost, or if the UAV encounters any unpredictable obstacle or other 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 MicroCopter Pro'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, MicroCopter Pro's proposed operations satisfy the relevant factors set forth by Congress and several additional mitigating factors that will ensure the safety and security of MicroCopter Pro's proposed small UAV operations.

Section 333 permits the FAA to authorize UAV operations without type, production, or airworthiness certification; MicroCopter Pro 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.

MicroCopter Pro's petition, similar to other petitions, seeks an exemption from the airworthiness certification regulation.⁸ The operational limitations proposed by MicroCopter Pro should be more than adequate to grant an exemption from airworthiness certification. Furthermore, we note that similar small UAV operations, conducted by hobbyists and modelers, are appropriately permitted without such certification.

With respect to pilot training and experience requirements, MicroCopter Pro's petition available to the public does not address this issue other than to state that its pilots and observers will hold second class medical certificates. Therefore, the Coalition takes no position on the merits of MicroCopter Pro's request from an exemption from 14 C.F.R. 61.113. As a general matter, however, 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. The Coalition recognizes the FAA's position in its recent section 333 guidance that section 333 does not allow the FAA to waive the requirement of a pilot to hold an airman certificate. We disagree. 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 airworthiness certificates, certificates of waiver, and certificates of authorization, "*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.⁹ 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. The Coalition agrees with the FAA's determination in the *Astraeus Aerial* and other dockets that a commercial pilot certificate is not required for the operators of UAVs for closed set filming:

[T]he experience obtained beyond a private pilot certificate in pursuit of a commercial pilot certificate in manned flight does not necessarily aid a pilot in the operational environment proposed by the petitioner; the FAA considers the overriding safety factor for the limited operations proposed by the petitioner to be the airmanship skills acquired through UAS-specific flight cycles, flight time, and specific make and model experience, culminating in verification through testing.

The Small UAV Coalition believes this reasoning supports a UAV/UAS-focused training and experience regimen that should obviate not only a commercial pilot certificate but also a private pilot certificate because the training will be focused on the particular skills of operating the particular small UAV and the particular nature of UAS operations. The specific requirements for the pilot in command set out in summary form in the FAA's grant of exemptions to *Astraeus Aerial* and other petitioners,¹⁰ other than the requirement to hold a private pilot certificate and

⁸ 14 C.F.R. Part 21 Subpart H.

⁹ 49 U.S.C. 44701(f).

¹⁰ The PIC must have accumulated and logged at least 200 flight cycles and 25 hours of total time as a UAS pilot and at least 10 hours logged as a UAS pilot with similar UAS type (single blade or multirotor), and 5

third class medical certificate, are appropriately focused on UAS operations and the particular UAV.

The small UAV rulemaking will benefit from safety determinations made by the FAA under section 333, including making a positive decision on MicroCopter Pro'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 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 MicroCopter Pro 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.

As previously discussed, however, we do not believe the FAA is required to, and should not, impose a requirement across the board that small UAV operations must be conducted within the line of sight of the pilot in command. The concept used in section 333 is "visual line of sight" with further specification.¹¹ In its grant of the Astraeus Aerial petition, the FAA required that all operations must be operated within the visual line of sight of *the pilot in command*. The FAA also requires that operations include a visual observer ("VO"), and added that the "VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times." We do not believe a visual observer should be required for all small UAV operations, but do agree that the presence of one

hours as a UAS pilot with the make and model of the UAV and three take-offs and landings in the preceding 90 days. Also, the PIC must have successfully completed the knowledge and skill test set forth in the manuals submitted to the FAA on a confidential basis.

¹¹ In section 334, Congress used the term "within the line of sight of the operator". In section 336, Congress used the term "flown within the visual line of sight of the person operating the aircraft."

or more visual observers may allow the UAV to be operated beyond the visual line of sight of the direct operator.

We also do not believe the FAA is required to impose a pilot certification requirement, but has discretion under section 333 to waive this requirement. At a minimum, the FAA should provide an exemption from Part 61 and approve training, experience, and testing regimens that pertain to UAV/UAS commercial operations, the particular UAV to be operated, the nature of the operations, and the airspace and altitude in which the UAV will be operated.

The FAA has determined that the TSA vetting of each airman who obtains a private pilot certificate satisfies the section 333 criterion that the UAS operations not pose a threat to national security. Congress did indeed focus on the security of UAS *operations* but did not require any screening or vetting of UAS operators, pilots, or observers. The Small UAV Coalition believes that such a requirement imposes an unnecessary burden and is unduly focused on a pilot rather than the nature of the operations. Regarding the latter, the factors set forth in section 333 should allow the Secretary to determine the security of such operations.

The Small UAV Coalition also does not believe a small UAS operator should be required in all cases to submit a plan of activities to the local Flight Standards District Office. Nor does the Coalition believe that in all cases a Certificate of Authorization (“COA”) and/or Notice to Airmen (“NOTAM”) be issued. Notifying the FAA, whether it is a FSDO or Air Traffic Control, or both, should be necessary only when there is a potential conflict with manned aircraft operations because of the altitude of the UAV operation or its proximity to airports.

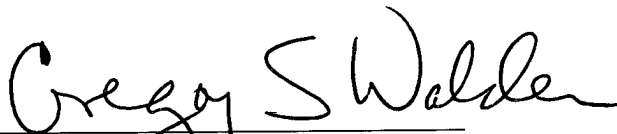
With respect to operations within 5 miles of a non-towered airport, the FAA requires the operator to obtain a letter of agreement with that airport management. We believe it is sufficient to require the operator to be mindful of any nearby airfield and knowledgeable about arrival and departure paths; it should not be necessary to obtain an agreement with airport management where the operation will not conflict with the airport’s operations.

Conclusion

MicroCopter Pro’s petition demonstrates that its small UAS operations can be conducted safely with a number of voluntary safety precautions. In the view of the Small UAV Coalition, the FAA should expeditiously grant MicroCopter Pro 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 also believes that MicroCopter Pro’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 MicroCopter Pro petition – including several factors we have identified that are not enumerated in section 333 – all support grant of MicroCopter Pro’s petition. In considering whether to authorize UAV operations such as MicroCopter Pro’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 MicroCopter Pro, so that globally important UAV development work can occur in the United States.

A handwritten signature in black ink that reads "Gregory S. Walden". The signature is written in a cursive style with a large, looped "G" and "W".

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September 29, 2014