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

IN THE MATTER OF

Petition of Asymmetric Technologies, LLC for Exemption

Docket Number: FAA-2014-0816

COMMENTS OF THE SMALL UAV COALITION

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December 3, 2014

Filed with www.regulations.gov

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Introduction

The Small UAV Coalition[1] is pleased to provide its comments in support of the petition for exemption submitted by Asymmetric Technologies, LLC ("Asymmetric") under section 333 of the FAA Modernization and Reform Act of 2012 ("the Act"). Asymmetric proposes to operate the microdrones GmbH md4-1000 small unmanned aerial vehicle and system ("UAV" and "UAS") for the purpose of aerial inspection of a bridge in Mohave Country, Arizona.[2] 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 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 Asymmetric 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

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[1] Members of the Small UAV Coalition include 3D Robotics, Aerialtronics, Airware, Amazon Prime Air, DJI Innovations, Ehang, Google[x] Project Wing, GoPro, Parrot, PrecisionHawk, Sky-Futures, and SkyWard IO.

[2] Although petitioner refers to this location as the "initial" location and "first inspection," petitioner does not explicitly request exemption authority beyond the Mohave County bridge site.

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 continue to work expeditiously to implement its section 333 authority with these policy considerations in mind. 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 one to be operated by Asymmetric 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 Asymmetric Petition

As noted above, Asymmetric seeks FAA permission to conduct inspection of a bridge in Mohave County, Arizona. Although Asymmetric'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.), Asymmetric 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 Asymmetric 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.

Asymmetric proposes to operate the microdrones GmbH md4-1000 battery-powered quadcopter UAV, weighing less than 15 pounds (including payload), within the visual line of sight of the pilot and/or observer, below 400 feet AGL, only within a defined sterile area. Maximum speed is 29 knots; the UAV has the capability to hover, and to move vertically and horizontally, simultaneously. Maximum flight time will be 45 minutes; flights will be terminated at 25% battery power reserve should that occur before the 45-minute limit. In the event of a loss in communications or GPS signal, the UAV has the capability of returning to a pre-determined location within the operational area and land. In the event of an emergency or an unpredictable obstacle is encountered, the UAV operation will be aborted.

The UAS operator will hold at least a private pilot certificate with rotorcraft experience and hold a third-class medical certificate.

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

Section 333 directs the FAA to authorize UAV operations that may safely operate in the national airspace system; Asymmetric'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,[3] 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 Asymmetric.

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.[4]

The Small UAV Coalition also 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,[5] 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 that requirements imposed on general aviation under Part 91. Certainly requirements may differ depending on whether a UAV will be operating in Class G airspace or controlled airspace. Manned aircraft are currently subject to different requirements based on the airspace in which they are operated. Here, Asymmetric proposes to operate its UAV below 400 feet AGL within the visual line of sight of the operator and/or observer. These and other precautions are more than adequate to ensure safe operations by Asymmetric.

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

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

[4] 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 Asymmetric's petition.

[5] 49 U.S.C. 44701(d) and 44702(b).

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

When evaluating the Asymmetric 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 Asymmetric'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 Asymmetric's petition, such as: the remote 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 Asymmetric's case, the weight of the md4-1000, with payload, is less than 15 pounds. Considering the altitude and airspace in which its small UAV will be operated, and other precautions to be taken, Asymmetric's UAV operations will not likely 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. Asymmetric's small UAV will travel no faster than 29 knots, and the operations covered by this petition will take place below 400 feet AGL, within the visual line of sight of the pilot and/or observer. 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. Although Asymmetric does not address distance to the nearest airport, it is apparent that Asymmetric will be able to operate its UAV without interfering with any manned aircraft operations.[6]

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. Asymmetric states that the bridge is located in a remote, sparsely populated area. It appears that the only persons within the inspection area (other than authorized personnel) would be in vehicles crossing the bridge. Under these circumstances, Asymmetric's operations do not pose a risk to any congested or populated area.

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 Asymmetric'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, Asymmetric's proposed operations satisfy the relevant factors set forth by Congress and several additional mitigating factors that will ensure the safety and security of Asymmetric's proposed small UAV operations.

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

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[6] Asymmetric notes that the bridge is located in special use airspace, airspace used by the military, but believes that operations below 400 feet AGL will not pose any risk to manned aircraft operations in that airspace.

Asymmetric's petition, similar to other petitions, seeks an exemption from the airworthiness certification regulation.[7] The technological capabilities of the md4-1000 UAV and the operational limitations proposed by Asymmetric should be sufficient to grant an exemption from airworthiness certification. We also 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, Asymmetric's operators will hold at least a private pilot certificate, and third-class medical certificate.

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 UAV operator 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.*" Thus, Congress vested FAA with discretion to waive other certificates, including an airman certificate.

Even if section 333 were read not to convey that discretion, the FAA has sufficient waiver and exemption authority in the Federal Aviation Act. Subsection (f) of section 44701 provides the Administrator with plenary authority to grant an exemption "from a requirement of a regulation prescribed under subsection (a) or (b) of this section or any of sections 44702-44716 of this title if the Administrator finds the exemption is in the public interest."

The statutory requirement for an airman certificate is section 44703.[8]

Accordingly, the FAA has discretion to waive or exempt the pilot certification requirement with respect to small UAS operators and should do so. 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 exemptions 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

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[7] 14 C.F.R. Parts 21, Subpart H, and 27.

[8] Even if FAA construes its exemption authority to be limited to its regulations, it certainly has discretion to exempt UAV operators from the requirements of Parts 61 and 67 and develop an airman certificate specifically designed for small UAV operations.

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, (other than the requirement to hold a private pilot certificate and 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 Asymmetric'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 Asymmetric 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, 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.[9] 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 or more visual observers may allow the UAV to be operated beyond the visual line of sight of

[9] 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."

the direct operator. Here, Asymmetric's UAV will be operated within the line of sight of the pilot and/or observer, who will be in constant communication with each other.

As explained above, we also do not believe the FAA is required to impose a pilot certification requirement, but rather has discretion under section 333 and subsection 44701(f) 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.

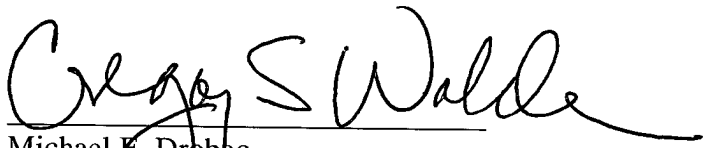
The Small UAV Coalition also does not believe a small UAS operator should be required in all cases to submit a plan of activities to the local Flight Standards District Office ("FSDO"). Nor does the Coalition believe that in all cases a Certificate of Authorization ("COA") and/or Notice to Airmen ("NOTAM") 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. Given the remote location that Asymmetric will operate, the Coalition does not believe it is necessary to obtain a COA or submit a plan of activities to the FSDO; notice to the nearest airport and to the military operations command of the special use airspace should suffice.

With respect to operations in proximity 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

Asymmetric'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 Asymmetric authority under section 333. The Small UAV Coalition believes that Asymmetric'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 Asymmetric petition – including several factors we have identified that are not enumerated in section 333 – support grant of Asymmetric's petition. 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 Asymmetric, so that globally important UAV development work can occur in the United States.



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