

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

IN THE MATTER OF

**Airworthiness Criteria: Special Class Airworthiness Criteria for
the --**

**3DRobotics Government Services 3DR-GS H520-G; Docket No.
FAA-2020-1083**

**Zipline International Inc. Zip UAS Sparrow; Docket No. FAA-
2020-1084**

Matternet, Inc. M2; Docket No. FAA-2020-1085

Amazon Logistics, Inc. MK27; Docket No. FAA-2020-1086

Wingcopter GmbH 198 US; Docket No. FAA-2020-1087

**TELEGRID Technologies, Inc. DE2020; Docket No. FAA-2020-
1088**

**Percepto Robotics, Ltd. Percepto System 2.4; Docket No. FAA-
2020-1089**

Flytrex, Inc. FTX-M600P; Docket No. FAA-2020-1090

Flirtey Inc. Flirtey F4.5; Docket No. FAA-2020-1091

Airobotics Inc. OPTIMUS 1-EX; Docket No. FAA-2020-1092

COMMENTS OF THE SMALL UAV COALITION

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COMMENTS OF THE SMALL UAV COALITION

The Small UAV Coalition (“Coalition”)¹ is pleased to support the FAA’s proposed airworthiness criteria for ten unmanned aircraft system (“UAS”) models. The Coalition supported the FAA’s initial finding that UAS should be type-certificated as special class aircraft because airworthiness standards for UAS have not been established in a rule. As the FAA recognizes in the preamble to these proposed criteria, existing standards do not envision aircraft with no pilot on board and the technologies concomitant with that fact. The Coalition strongly supports adoption of these airworthiness criteria, which will enable routine and ubiquitous operations beyond the visual line

¹ Members of the Small UAV Coalition are listed at www.smalluavcoalition.org

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of sight of the remote pilot and over human beings. The Coalition urges the FAA to move in parallel to adopt an operating rule for such BVLOS and operations over people, so that UAS type-certificated under the special class standards and having obtained an airworthiness certificate may operate under a rule rather than a waiver or exemption.²

The Coalition also urges the FAA to proceed to establish standards for detect-and-avoid technology, both on-board and ground-based. Although the durability and reliability-based TC does not support the means by which applicants can certify a system that complies with 14 CFR 91.113 as currently written, it should support the means by which they can certify systems that provide sufficient detect and avoid (DAA) safety mitigations specific to their CONOPS. In proposed UAS.310, the FAA provides the facility for applicants to certify DAA systems for aircraft and obstacle avoidance. DAA technology is the key to unlocking BVLOS operations at scale, and the FAA should devote sufficient attention and resources to adopting the means by which it can be placed into service.

The FAA has proposed the same set of airworthiness criteria for all ten UAS models, which range from less than 5 pounds to over 55 pounds, with various designs (fixed-wing, rotorcraft and hybrid), speeds, and systems complexity. Notwithstanding these differences, under a performance-based approach these UAS models have safety-critical attributes that will enable them to meet those airworthiness criteria, even if the approaches may vary.

The Coalition strongly supports the FAA's decision to adopt performance standards, "mitigating hazards by establishing safety outcomes that must be achieved, rather than by establishing prescriptive requirements that must be met." The Coalition supports this principle as a default position for UAS regulation.

For instance, the Coalition has supported the development of durability and reliability standards to certificate USS models, and this includes the Durability and Reliability ("D&R") hours matrix, which prescribes the number of failure-free hours for a particular population density. The proposed D&R provision in UAS.300 provides that the UAS --

must be designed to be durable and reliable commensurate to the maximum population density specified in the operating limitations.

Both the traditional test and certification methodologies that are based on system, subsystem and component level analysis and test, and the D&R approach that demonstrates reliability at the UAS level, are suitable means of satisfying flight test criteria. With regards to the FAA's proposed D&R test criteria, which requires that no failures occur that result in loss of flight, loss of control, loss of containment, or emergency landing outside of the operator's landing area, the Coalition recommends that a single failure during testing should not automatically restart counting the number of flight test operations set for a particular population density. Rather, if the applicant can identify the failure through root cause and fault tree analysis and provide a validated mitigation to ensure it will not recur, the number of consecutive failure-free operations and overall flight test hours allocation should be adjusted to be proportionate to the particular risk of that failure.

² The FAA has published a proposed rule for Operations Over People ("OOP"), and has pledged to publish final rule by the end of this year. As the Coalition and many other UAS stakeholders stated in comments on the proposed rule, the FAA's risk model is flawed and, if adopted, would impose a more restrictive framework than exists for airlines. The OOP operating rule should instead track the D&R testing standard proposed in these airworthiness criteria.

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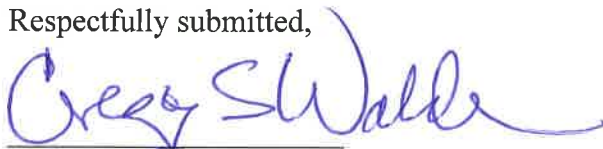
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More clarity needs to be provided over what constitutes an emergency landing inside/outside an operator's landing area as some UAS design elements could include an onboard health system that initiates a landing to lessen the potential of a loss of control event. In those cases if the landings could be demonstrated to occur in safe locations that should not invalidate the test plan.

The Coalition notes that for most of the UAS models, the FAA is proposing airworthiness criteria to enable a single remote pilot to operate up to 20 UAS at one time. Implicit in a 20 to 1 ratio is the operator's reliance on automation. Indeed, these operations are likely to be completely pre-programmed. Applicants should be permitted to demonstrate a higher pilot-to-aircraft ratio as they are acting more as an operator than a traditional pilot manipulating an aircraft's controls. Accordingly, the Coalition recommends that the criteria in UAS.310 for Capabilities and Functions address how these capabilities may permit a higher pilot-to-aircraft ratio.

In sum, the Coalition commends the FAA in moving forward with type and airworthiness certification of UAS as a special class of aircraft, using performance standards instead of prescriptive limits except where necessary.

Respectfully submitted,



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