March 2, 2020

Hon. Steve Dickson
Administrator
Federal Aviation Administration
800 Independence Avenue SW
Washington, DC 20691

Submitted at https://www.regulations.gov/comment?D=FAA-2019-1100-0001

RE: **Comments on the Remote ID of UAS NPRM**
Docket FAA-2019-1100

The Permanent Editorial Board[1] of the Aviators Code Initiative[2] provides the following comments responding to the Notice of Proposed Rulemaking entitled "Remote Identification of Unmanned Aircraft Systems"[3] (NPRM).

The NPRM represents welcome and helpful progress towards unmanned aircraft system (UAS) integration but needs further development. This comment considers four remote identification of UAS (RID) issues affecting manned aircraft safety. The NPRM lacks: (1) attention to manned aircraft safety, (2) a general broadcast RID requirement, (3) an ADS-B Out mandate for Part 91 UAS VFR operations, and (4) a charting and RID requirement for FAA-recognized identification areas. Each of these issues is addressed in turn.

1. **Attention to manned aircraft safety**. The NPRM overlooks the potential safety benefits that RID data may offer for manned aircraft pilot situational awareness and collision avoidance with UAS.

   Discussion:

   A. The NPRM facilitates the use of RID data for unmanned aircraft pilots, the FAA, public safety officials, UAS Service Suppliers (USS), and the public, yet fails to include manned aircraft pilots.

B. RID data may enhance manned aircraft pilot situational awareness and collision avoidance with UAS. The NPRM Preface acknowledges that manned aircraft "could carry the necessary equipment to display the location of UAS operating nearby"[4] yet provides no responsive action.

C. The NPRM is inconsistent with relevant concept of operations (ConOps) such as the FAA's LAANC ConOps that states:

> Ideally, *all* NAS airspace users should have access to situational awareness information about UAS flights relevant to them. Disseminating UAS activity *to other airspace users* ensures safety of flight as UAS present additional safety concerns due to the ranges of UAS physical, flight performance, and operational characteristics that vary significantly from manned aircraft.[5]

D. To be effective, collision avoidance practices must engage *both* manned and unmanned aircraft pilots/operators, and must address the acute see-and-avoid challenges to each operation.[6]

Recommendations. The proposed RID rule should:

I. Make RID data available to manned aircraft pilots:

a. to contribute information that may be critical to flight safety.

b. via diverse communication channels, including ADS-B In, the internet, satellite, *and* broadcast RID.[7]

c. without undue restriction[8] or fee.[9]

II. Recognize that manned aircraft pilots are essential RID stakeholders.

2. **Limited RID UAS (no broadcast) impact on manned aircraft.** NPRM, Section 89.115 ("Limited remote identification unmanned aircraft systems") provides for network-based RID *without* simultaneous broadcast RID. Excluding broadcast RID will render many sUAS uncooperative (i.e., unsurveillable) to manned aircraft, thereby increasing collision risk.

Discussion:

A. The "Limited RID" category is problematic, creates unnecessary complexity, does not contribute to flight safety, and will be underutilized.[10] If a limited RID category is retained, it should provide broadcast RID, for

the reasons presented below. Alternatively, the Standard RID category should apply generally.[11]

B. NPRM, Preface, Section IV.C states that "[a] UAS that broadcasts or transmits remote identification information would contribute to a cooperative operating environment" and "[s]uch data could be used in UAS detect-and-avoid and aircraft-to-aircraft communication systems to aid in unmanned aircraft collision avoidance."[12]

C. By failing to include a general broadcast RID requirement, the NRPM overlooks a unique, useful, and viable safety enhancing capability.[13]

D. Most manned aircraft are not internet-equipped. Broadcast RID thus fills a coverage gap in network RID.

E. Unlike network RID, broadcast RID can provide position data of sUAS proximate to manned aircraft at *any* altitude, including sUAS encountering lost link and contingency/rogue status.[14]

F. The prohibition of sUAS use of ADS-B Out[15] diminishes manned aircraft surveillance of sUAS, and bolsters the urgency of a broadcast RID requirement.

G. The NPRM fails to demonstrate that excluding a general broadcast RID requirement is preferable from safety,[16] cost,[17] and regulatory compliance perspectives.[18]

Recommendations. The proposed RID rule should:

I. Revise NPRM, Section 89.320 ("Minimum performance requirements for limited remote identification unmanned aircraft systems") to require unmanned aircraft to broadcast per NPRM, Section 89.310 ("Minimum performance requirements for standard remote identification unmanned aircraft systems").

II. Specify a maximum legally permissible transmit power level to best enable reception by manned aircraft.[19]

III. Indicate whether broadcast RID position data reflects GCS or sUAS location to improve situational awareness and collision avoidance with manned aircraft.[20]

IV. Promote early equipage through a subsidization program for the installation of broadcast RID for sUAS manufactured without broadcast RID capability.[21]

3. **ADS-B Out Prohibition of Part 91 Operations.** NPRM, Section 89.125 ("Automatic Dependent Surveillance-Broadcast (ADS-B) Out prohibition") prohibits the use of ADS-B Out to satisfy compliance with remote identification requirements. This rule would make affected UAS unsurveillable and uncooperative to most manned aircraft, and thus create a safety hazard.

   Discussion:

   A. The anticipated volume of unmanned Part 91 VFR UAS operations over the next 5-7 years does not support the prohibition of ADS-B Out use.

   B. The inclusion of certain Urban Air Mobility (UAM) operations under NPRM, Section 89.125 is uncertain,[22] and in any event, projected UAM Part 91 UAS volume over the next 5-7 years does not support the prohibition of ADS-B Out use for Part 91 operations.

   C. Industry proposals to mitigate future ADS-B Out saturation risks[23] should support unmanned Part 91 VFR use of ADS-B Out.

   Recommendations. The proposed RID rule should:

   I. Revise NPRM, Section 89.125 to:

      a. require UAS use of ADS-B Out for both VFR and IFR operations under Part 91.

      b. provide that Part 91 VFR unmanned aircraft operations may be terminated, by future rule, should the Administrator determine that either:

         i. "remote identification [provides] a similar safety function . . . to various stakeholders"[24] including to manned aircraft;[25] or

         ii. Part 91 unmanned VFR operations cause surveillance system saturation.

4. **FAA-Recognized Identification Area(s) (FRIA).** NPRM, Section 89.120 ("Unmanned aircraft systems without remote identification") permits FRIA without RID. FRIA are not presented in aeronautical charts, and create a safety risk.

   Discussion:

   A. As a practical matter, FRIA are unknown by the manned aviation community and undiscoverable while in flight.

B. Many FRIA are anticipated to be located near airports, heliports, and high-density aircraft routes.

C. Manned pilots are obligated to be familiar with all available information concerning the flight.[26] Charting FRIA would enhance manned pilot situational awareness of the potential hazard.

Recommendations. The proposed RID rule should:

I. Require that all FRIA to be charted in aeronautical charts, including in relevant VFR and IFR charts.[27]

II. Require use of broadcast RID, and encourage the use of network RID at FRIA.

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[1] Members of the Permanent Editorial Board include: Don Arendt, Ph.D., Michael S. Baum, JD, MBA, ATP, Ric Peri, Bill Rhodes, Ph.D., Stan Rose, Rusty Sachs, JD, DhE, MCFI, and Capt. Don Steinman (AA, ret.), ATP, CFII.

[2] *See* www.secureav.com. Contact: PEB@secureav.com.

[3] 48 Fed. Reg. 72438-72524 (Dec. 31, 2019), https://www.federalregister.gov/documents/2019/12/31/2019-28100/remote-identification-of-unmanned-aircraft-systems ["NPRM"].

[4] NPRM, Preface, Sect. IV.A.3. Situational Awareness. *See* note 13, below (no additional hardware required).

[5] FAA, *Low Altitude Authorization and Notification Capability (LAANC) Concept of Operations*, V1.1, Sect. 5.3, p. 14 (May 12, 2017), https://faaco.faa.gov/index.cfm/attachment/download/75780 (emphasis added).

[6] Challenges include, for example, remote pilot slant-angle sight (altitude and distance) estimation, UAS pilot training limitations, and DAA equipage limitations.

[7] *See generally* Aviators Code Initiative, *Improving Cockpit Awareness of Unmanned Aircraft Systems Near Airports* (2019), http://www.secureav.com/UAS-Awareness-Listings-Page.html ["ACI 2019"], pp. 9-10 (urging diverse methods for UAS position data reception by manned aircraft).

[8] Privacy rights of UAS operators are respected. This proposal requires *only* de-identified sUAS position data.

[9] Analogously, the free availability of ADS-B In (FIS-B and TIS-B) data serves as a helpful model. *See* note 22, below (rebate program).

[10] Aircraft with a <400 ft. operating range, weighing < 250g are thus exempt from registration and remote ID requirements.

[11] The NPRM includes broadcast RID as part of its "Standard RID". NPRM, Sect. 89.110. Similarly, the *Tier 2* recommendation of the UAS-ID ARC includes both broadcast and network RID, FAA, *Unmanned Aircraft Systems (UAS) Identification (ID) and Tracking Aviation Rulemaking Committee (ARC), Recommendations, Final Report* (Sept. 30, 2017), Sect. 3.3.3, https://www.faa.gov/regulations_policies/rulemaking/committees/documents/media/UAS%20ID%20ARC%20Final%20Report%20with%20Appendices.pdf ("*Local broadcast should always be a requirement* as it provides a backup

means of ID and tracking if the network is compromised, degraded, or unavailable. This tier is intended to address both public safety needs as well as ATC/UTM needs that may arise.") (emphasis added).

[12] While focused on BVLOS operations, broadcast RID should support VLOS operations too. *See* NPRM, Preface XII.C.4 ("Manned aircraft, especially those operating at low altitudes where UAS operations are anticipated to be the most prevalent, such as helicopters and agricultural aircraft, could carry the necessary equipment to display the location of UAS operating nearby."); and Jay Merkle, Exec. Dir., UAS Integration Office, FAA, Remarks at the Royal Aeronautical Society, in Avionics Int'l (Feb. 7, 2020), https://www.aviationtoday.com/2020/02/07/faa-exploring-manned-aviation-can-benefit-drone-remote-id/?oly_enc_id=5780G0396467F4Y ("we have to have different strategies for where ADS-B is required versus where it is not required" also suggesting a future RFI "on how manned aviation could take advantage of remote identification signals").

[13] Broadcast RID sensing for situational awareness and collision avoidance could be implemented by manned aircraft quickly and voluntarily on uncertified tablets and avionics via firmware update. Moreover, the effective range of broadcast RID is extensible, such as via Bluetooth 5 Long Range (BT5LR) technology. *See* ASTM Int'l, F3411, *Standard Specification for Remote ID and Tracking*, https://www.astm.org/DATABASE.CART/WORKITEMS/WK65041.htm ["ASTM Remote ID"] (Appendix X1.2.3 asserts BT5LR "drastically increases the potential range" providing "about four times that of BT4" and that "such standards are being widely adopted"; and Appendix X1.2.4 describes Wi-Fi Aware's "higher power numbers" and expected range of "more than 4km @26dBm in US.").

[14] NPRM, Sect. 89.320(l) requires that certain UA "must be designed to operate no more than 400 feet from its control station." However, this constraint does not necessarily limit the inherent aeronautical range of UA upon malfunction or intentional tampering (e.g., a UA with geofencing failure might retain aeronautical range exceeding the 400 ft. limitation).

[15] NPRM, Sect. 89.125 Automatic Dependent Surveillance-Broadcast (ADS-B) Out prohibition. *See* Sect. 3 of this comment.

[16] *See* Ryan J. Wallace, et al., *Cleared to Land: Pilot Visual Detection of Small Unmanned Aircraft During FInal Approach*, Int'l J of Aviation, Aeronautics, and Aerospace, 6(5) (Dec. 2019), https://commons.erau.edu/ijaaa/vol6/iss5/12/ (growing identified risks to manned aircraft by sUAS operating in controlled airspace, and exceeding the NPRM's "Limited RID" range (i.e., 400 ft of the ground control station (GCS)), whether intentional or due to equipment failure). *See also* [ACI 2019].

[17] Broadcast RID is purportedly the least-cost option. The incremental cost of adding Broadcast RID to Network ID capability is de minimis. A uniform RID broadcast/network requirement should reduce manufacturing costs, improve economies of scale, reduce implementation complexity, and offer owners/operators greater value.

[18] Many sUAS operators will likely not subscribe, or remain subscribed to a fee-based network RID service.

The NPRM fails to justify the Limited RID schema (of precluding broadcast RID).

[19] *See* note 13 (addressing broadcast range); and [ASTM Remote ID], Table A3-2 - BCMinEIRP Values (presenting minimum broadcast Effective Radiated Power (EPR) values for both Wi-Fi and Bluetooth).

[20] Even position data reflecting GCS position will still have strategic deconfliction value to manned aircraft.

[21] Rebate programs have precedent. *See, e.g.,* FAA, *General Aviation ADS-B Rebate Program*, https://www.faa.gov/nextgen/equipadsb/rebate/faq/#q1.

[22] The NPRM does not indicate the extent to which unmanned UAM operations will be authorized under Parts 91, 135 or waiver.

[23] *See, e.g.,* uAvionix, *uAvionix Receives an FAA Transmission License to Test UDS-B Solution for DAA and Remote Identification* (Oct. 7, 2019), https://uavionix.com/uavionix-test-uds-b-solution/.

[24] NPRM, Preface, Sect. XVI Use of ADS-B Out and Transponders.

[25] Broadcast RID could replace ADS-B Out if and when it is determined to be an adequate substitute that provides effective manned aircraft situational awareness of, and collision avoidance with, UAS. This comment does not suggest that Broadcast RID is currently an adequate substitute.

[26] 14 C.F.R. Sect. 91.103 *Preflight action*.

[27] Conventional aeronautical charts could depict such areas via non-obfuscating watermark, and electronic charts via configurable optional layers—adhering to recognized human factor presentation guidance. *See, e.g.,* FAA, Advisory Circular AC 120-76D, Subj: Authorization for Use for Electronic Flight Bags (Oct. 27, 2020), https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-76D.pdf; and [ACI 2019], Sect. 6. Additional Future Recommendations, a. Conventional Notification Tools (proposing LAANC UAS Facility Map presentation in aeronautical charts).

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