TERMS OF REFERENCE

Special Committee (SC) 147

Aircraft Collision Avoidance Systems

Revision 21 DRAFT

SC LEADERSHIP:

Position	Name	Affiliation	Telephone	Email	Change
Co-Chair	Ruy Brandao	Honeywell	425-376-2066	ruyjr.brandao@HONEYWELL.COM	Need SC-147 Secretary
	J. Stuart Searight	FAA/ANG-C33	609-485-5036	stuart.searight@faa.gov	
Government Authorized Representative	Matt Haskin	FAA/AIR-626C	202-267-2964	Matthew.D.Haskin@faa.gov	
Secretary	Vacant				

BACKGROUND:

Since it was established in 1980, SC-147 has produced and maintained minimum operational performance standards (MOPS) for Collision Avoidance Systems (CAS) and surveillance techniques required to meet desired levels of performance and safety. Specifically, SC-147 developed MOPS for the Traffic Alert and Collision Avoidance System (TCAS II), which is a mandated safety system for larger aircraft throughout most of the world. SC-147 also has and will continue to assess performance of these systems in various airspaces and operational environments, which lead to an update to the TCAS II MOPS (DO-185B) in 2008 to improve the performance of the sense reversal logic under certain conditions.

Since 2013, SC-147 has worked with EUROCAE WG75 to develop a new generation of collision avoidance systems called ACAS X. ACAS Xa was developed to be a drop-in replacement for TACS II systems with improved surveillance and alerting algorithms better designed for modern airspace environments, but with the same set of Resolution Advisory (RA) alerts so that pilots trained on TCAS II can fly ACAS Xa equipped aircraft without additional training. The ACAS Xa/Xo MOPS (DO-385) also included a means to allow flight crews to select operationally specific alerting schemes with selected aircraft.

Recently, SC-147 has also worked closely with SC-228 on standards to ensure interoperability between all existing and future CAS and Detect and Avoid (DAA) systems

(DO-382) and variants of ACAS X for Unmanned Aircraft Systems (UAS) and Vertical Take-off and Landing (VTOL) aircraft that are compliant and integrated with DAA standards published in versions of DO-365(). In December, 2020, SC-147 published the ACAS Xu MOPS (DO-386) which in which is a DAA/CA system for fully equipped (Transponder and ADS-B Out) aircraft flying in controlled airspace and receiving ATC services.

PRODUCT DELIVERABLES:

Product	Description	FRAC/RAC Completion Due Date	Projected Publication Date**	Change
Minimum Operational Performance Standards (MOPS) for ACAS Xr.	MOPS to specify the ACAS Xr designed to support crewed and uncrewed rotorcraft and VTOL aircraft, and Urban/Advanced Air Mobility (UAM/AAM) type of operations	July 2025	June2026	Date Change
Minimum Operational Performance Standards (MOPS) for Cooperative Surveillance Systems.	A targeted MOPS to specify the required performance for cooperative surveillance including an omni-directional antenna that can support Detect and Avoid systems for smaller UAS, rotorcraft, and VTOL-type platforms consistent with operations supported by ACAS Xu and ACAS Xr.	July 2025	June 2026	New Deliverable
Minimum Operational Performance Standards (MOPS) for ACAS Xu Revision A DO-386(A)/ED-275(A)	A new version of the system logic (Volume 2 Algorithm Design Description) that incorporates the DAA DO-365C Class 5 terminal area functionality. Revision A will also include a limited number of corresponding changes to Volume 1 language to address new inputs and requirements for the terminal area functionality.	November 2025	June 2026	New Deliverable

Product	Description	FRAC/RAC Completion Due Date	Projected Publication Date**	Change
Guidance for Validation of Collision Avoidance Systems	Guidance document to specify specific development steps, performance and safety metrics, and various types of encounter models needed to ensure new CA systems are robust and interoperable with existing systems	September 2026	December 2026	New Deliverable

SCOPE:

The variants of ACAS X MOPS will specify minimum requirements for collision avoidance systems including surveillance, tracking and threat resolution functionalities. These MOPS will define the aircraft types, minimum required equipage, and intended operational environments for which the system is designed, and specify the optimized logic methodologies used by the collision avoidance logic and its performance, as well as providing testing of all requirements.

In addition to developing the deliverables stated above, the committee will provide a venue for industry discussion of any near-term operational performance of TCAS II systems observed within the NAS.

New operational environments that are envisioned to support UAS and UAM operations such as UTM and ATM will be considered and leveraged in the design and requirements development of the ACAS sXu and ACAS Xr MOPS. The ACAS Xu, sXu, and Xr MOPS will be used by the regulators as a basis for new or revised Technical Standard Order(s) and guidance material as appropriate. These MOPS are also envisioned to be aligned with SC-228's ongoing Detect and Avoid standards development efforts. SC-147 will continue to assess the safety performance and operational impact of all Collision Avoidance Systems as they are integrated into the NAS and other airspaces.

ENVISIONED USE OF THE DELIVERABLES:

The ACAS Xa/Xo, ACAS Xu, ACAS sXu, and Xr MOPS will be used by the regulators as a basis for new Technical Standard Order(s) and guidance material as appropriate.

Any MOPS developed for collision avoidance systems or DAA systems that fall under the purview of the CAS Interoperability MASPS (DO-382) will show traceability to the higher-level requirements and guidance found in that standard.

SPECIFIC GUIDANCE:

Special Committee 147 shall coordinate with Special Committee 186 for all issues pertaining to the use of ADS-B as a potential surveillance source within the ACAS X systems.

For the development of both the ACAS sXu and ACAS Xr MOPS:
- Special Committee 147 shall work with Special Committee 228 to appropriately determine the operational envelopes of UAS and rotorcraft systems that will be supported by ACAS sXu and Xr as well as determining any other constraints or assumptions placed on the capabilities of the ACAS sXu and Xr systems, such as sensor performance and available Size, Weight, and Power (SWAP).
- Other areas of coordination include, but are not limited to: minimum equipage and surveillance performance supported by ACAS sXu and development of equipment classes envisioned in order to support a wide range of UAS operational performance, sensor performance, and related SWAP constraints.

TERMINATION:

Activities of Special Committee 147 will terminate with approval by the PMC of the committee's final document. Any change/extension of the committee's work program requires prior PMC approval.