

Special Committee 147

**MINIMUM OPERATIONAL PERFORMANCE STANDARDS FOR TRAFFIC ALERT AND
COLLISION AVOIDANCE SYSTEMS AIRBORNE EQUIPMENT**

The 106th meeting of RTCA SC-147 and 79th meeting of EUROCAE WG-75 was held on 21 September 2023; this Plenary was a virtual-only meeting with WebEx provided by RTCA.

The following Leadership was present:

J. Stuart Searight	Co-Chair, Federal Aviation Administration
Ruy Brandao	Co-Chair, Honeywell International
Guido Manfredi	Chair, EUROCAE WG-75
<i>vacant</i>	SC-147 Recording Secretary
Pat Maggard (for Matt Haskin)	Government Authorized Representative
Brandi Teel	Program Director RTCA
Alex Engel	Tech PM EUROCAE

1. Chairmen's Opening Remarks / Introductions

Mr. Stuart Searight opened the meeting by welcoming everyone to what was expected to be a rather brief joint Plenary of SC-147 and WG-75. Stuart first thanked the Co-chairs of the Surveillance and Threat Resolution Working Groups as well as the key members of the ACAS X Program Office for their planning and productivity in the meetings held Monday through Wednesday. Stuart continued by stating that there were two primary agenda topics for this meeting: first, to formally approve including the Julia Code as part of the supplemental material for each ACAS X MOPS on the RTCA share drive, and second, to receive updates on a few key European activities, namely the rulemaking process to recognize ACAS Xa as a suitable alternative to TCAS II, and ongoing development and analysis efforts of European DAA standards and system development. Mr. Searight then invited Ruy Brandao and Guido Manfredi to share any opening remarks. Both quickly welcomed everyone and also shared their appreciation for the work done earlier in the week.

2. Anti-Trust Statement & RTCA Policy

Brandi Teel and Alex Engel presented all RTCA and EUROCAE policy statements regarding membership, participation in meetings, and use of proprietary information in approved documents. Ms. Teel concluded these statements with instruction for everyone to record their attendance via RTCA AerOpus.

3. Approval Of Meeting Minutes ([SC-147-WG-75 2023-03-16 Minutes FINAL](#))

Mr. Searight asked for approval of the minutes from the March 16 Plenary that focused on the final approval of Revision A for DO-385/ED-256. Stuart reminded everyone that there was still a need for someone to serve from either SC-147 or WG-75 as secretary for future Plenary sessions. A motion was made, and the Minutes were approved without comment.

4. Approval Of Agenda

Mr. Searight then did a brief review of the agenda. Stuart noted that Mr. Dominique Guillerm from European Union Safety Agency (EASA) was unavailable to join to present his update on European rulemaking for ACAS Xa/Xo (DO-385A/ED-256A) until later in the morning, so proposed that the entire European Update Agenda Item be moved to the end of the plenary to accommodate his availability. The proposal was agreed to, and the agenda was approved without further changes.

5. Proposal to make Julia source code available on RTCA/EUROCAE websites. ([230921 RTCA Distribution of ACAS X Julia Code V2](#))

- a. Stuart quickly level-set this agenda item mentioning that the Program Office had previously proposed that the Julia code based on the ADD for each ACAS X MOPS be included with other supplemental material that is made available on the RTCA web site for those who have downloaded an ACAS X MOPS. This would streamline such requests that presently are directed back to the Program Office and would ensure that anyone who purchased an ACAS X MOPS would have access to the Julia Code. Stuart and Ruy Brandao brought this proposal to the PMC in June and were told this would require a formal committee approval before they would consider it.
- b. Mr. Alex Engel asked if this material would also be available for EUROCAE members. Stuart mentioned this should be available for anyone who has purchased/downloaded an ACAS X MOPS, whether from RTCA or EUROCAE, and it is not limited to RTCA members. Stuart expected that such an arrangement for all supplemental materials is already coordinated and in place between RTCA and EUROCAE and this would just be a new set of material.
- c. Guido Manfredi asked about the legality of sending the Julia Code out into ChatGPT or other new similar forums. Brandi confirmed that any material on the RTCA ShareDrive is considered copyright protected.
- d. Mr. Randy Jacobson asked if differences were observed between the ADD and Julia Code, which should the implementer assume takes precedence. It was stated that it is the ADD which is the validated baseline version of the ACAS X logic and should be considered the “master” version if any differences with the Julia code exist. It was agreed that a statement stating this will be included with the Julia Code in the Supplemental Material.
- e. Stuart made the motion that this material be included in the supplemental material for each ACAS X MOPS, and Mr. Stacey Rowlan seconded it. Hearing no objections, Stuart said he and Ruy would bring the matter back to the PMC for formal approval at their December meeting.

6. Working Group Status Reports ([SC-147 WG8 Summary](#))

Ruy Brandao gave a brief review of the work done earlier in the week in joint working group sessions and by the Surveillance Working Group. This included an overview of which sections of the draft ACAS Xr MOPS has been written and reviewed and a brief review of a few key issues discussed. Ruy then showed the planned schedule for an initial review and comment (iRAC) process, comment adjudication, updating to a final draft of the both the ACAS Xr and Cooperative Surveillance MOPS, and the formal FRAC process for each. (See Agenda Item 7 Summary for specific dates.)

7. Future Meeting Schedule

Based on the discussion regarding the iRAC of both the ACAS Xr and the Cooperative Surveillance MOPS, it was agreed to have Working Group meetings April 9-11, 2024, prior to the release of the two MOPS for review. There will then be meetings the week of June 4, 2024, to formally address all comments.

A full summary of SC-147/WG-75 milestones and scheduled meetings is as follows:

- April 9-11, 2024: SC-147/WG75 Working Group Meetings
- April 15, 2024: iRAC Release for ACAS Xr and Cooperative Surveillance MOPS
- April 30, 2024: ACAS Xr V4 Performance Analysis Results Released
- May 17, 2024: iRAC Comment Period Closes
- June 11-13, 2024: Comment adjudication Meetings

- February 1, 2025: FRAC for both MOPS commences
- March 15, 2025: FRAC comment period closes
- June TBD, 2025: SC-147/WG-75 Meetings for comment resolution and MOPS approvals
- August, 2025: Final V&V Comment Resolution approval of both MOPS
- December, 2025: RTCA PMC and EUROCAE approval and publication

8. EUROCAE Status and Update. ([WG-105 DAA Activities](#))

- a. Mr. Guido Manfredi presented the first European update on the work being done and planned for DAA Standards within WG-105. The presentation included schedules for DAA OSEDs, MASPS, and MOPS as well as sensor. Guido shared wording in the WG-105 Terms of Reference defining these products and an overall schedule which anticipates all products to be completed by early 2025. The presentation concluded with a slide showing how the EUROCAE standards will map to corresponding RTCA documents.
 - i. Mr. Garfield Dean then mentioned the EUDAAS plans to have a fully functional DAA/CA system within four years. Garfield then noted there will need to be some validation of the DAA and CA aspects of the EUDAAS system for US airspace. Garfield wondered if that is something FAA might undertake or if it is activities that might need to be sponsored to be performed for US airspace.
 - ii. The discussion then focused on the proprietary aspects of the EUDAAS system and whether or not validation of a system not developed in direct compliance with an existing TSO-cited MOPS would be an RTCA/EUROCAE activity. From the discussion, it did appear EUDAAS's proprietary nature would not be allowed to be cited in an RTCA or EUROCAE standard as it would violate proprietary policies of both organizations. As far as any FAA validation or certification efforts, Neal said that would be an Aircraft Certification issue, not one for the program office. Given that neither Matt Haskin nor Pat Haggard were present, this part of the discussion was deferred.
- b. Mr. Dominique Guillerm joined the meeting to provide an update on European rulemaking for ACAS II systems (TCAS II v7.1 and ACAS Xa). Dominique stated he is not in charge of the NPA process, but only the areas supporting ACAS Xa. Mr. Guillerm then stated that it has been agreed within EASA that TCAS II v7.1 and ACAS Xa/Xo should be permitted for collision avoidance for air transport aircraft. Dominique reported that EASA plans to publish its official opinion on ACAS-Xa being suitable for use in European airspace (Single European Sky) by the end of the year (Q4 2023). The timeframe to update the regulation by the European Commission is normally one year after the EASA Opinion is published (Q4 2024). A decision on issuing an Acceptable Means of Compliance and Guidance Material (AMC/GM) relevant to ACAS-Xa should be available shortly after the regulation is adopted (Q4 2024). Dominique concluded by

noting that Certification Specifications (CS) for Airborne Communications, Navigation, and Surveillance (ACNS) systems and European Technical Standard Orders (ETSO) activities are rather independent of the publication of the EASA Opinion and regulation update and therefore, a decision can be issued in 2024.

Mr. Randy Jacobson noted the large number of comments received, and therefore wondered if there might be an industry forum so that everyone can review all submitted comments and EASA's responses. Dominique responded that this is not usually a public process, but that most comments and their resolutions are very straight forward. Dominique also said EASA will often contact commentors one-on-one to discuss comment resolutions. Randy expressed concern that some language in the drafted rulemaking was ambiguous or showed some misunderstandings of how the Collision Avoidance systems work today, and that there would be benefit for all parties for a public forum to discuss. While Dominique appreciated the perspective, he maintained his belief that normal EASA processes would be followed and hoped all will be satisfactory to all parties and the end of the process.

9. Other Items

Mr. Searight asked if there was anyone with any other topics to present or discuss. As there were not, he moved on to closing the meeting.

10. Meeting Close

Mr. Searight thanked everyone for their participation and gave special thanks to the WG Co-chairs and key Program Office personnel who organized and prepared presentations for the week's WG meetings. Mr. Brandao and Mr. Manfredi concurred and thanked everyone for such a productive week.

Attendees:

Last Name	First Name	Company Name
Beckwith	Richard	Federal Aviation Administration (FAA)
Bender	Walter	Johns Hopkins University Applied Physics Laboratory
Brandao	Ruy	Honeywell International, Inc.
Castle	Michael	Johns Hopkins University Applied Physics Laboratory
Ciaramella	Kathryn	Federal Aviation Administration (FAA)
Dean	Garfield	EUROCONTROL
Dutle	Aaron	NASA
Edwards	Matt	MIT Lincoln Laboratory
Engel	Alexander	EUROCAE
Govers	Francis	Bell Helicopter Textron, Inc
Groll	Margarete	MIT Lincoln Laboratory
Guendel	Randal	MIT Lincoln Laboratory
Guillerm	Dominique	European Union Aviation Safety Agency (EASA)
Harrison	Austin "AK"	Garmin Ltd.
Hirt	Ruth	Federal Aviation Administration (FAA)
Huck	Volker	EUROCONTROL
Jacobson	Randy	Collins Aerospace
Johnson	Rudy	Sagetech Corp.
Knickelbein	Jeff	
Kobzik-Juul	Barbara	Johns Hopkins University Applied Physics Laboratory
Kuffner	Maria Picardi	MIT Lincoln Laboratory
Kuhlman	Kyle	Garmin Ltd.
Lee	Jamie	Supernal
Long	Anthony	Federal Aviation Administration (FAA)
Lorek	Edward	U.S. Navy
Maggard	Pat	Federal Aviation Administration (FAA)
Manfredi	Guido	Volocopter
Monk	Walter	Constellation Aviation Solutions, LLC
Panken	Adam	MIT Lincoln Laboratory
Peterson	Owen	Transport Canada
Rahman	Mohammed	Federal Aviation Administration (FAA)
Reed	Mark	Air Lines Pilot Association (ALPA)
Rowlan	Stacey	Sagetech Corporation
Ruano	Luis	Indra Sistemas S.A.
Saunders	Jeffery	
Searight	Stuart	Federal Aviation Administration (FAA)
Silbermann	Josh	Johns Hopkins University Applied Physics Laboratory
Smearcheck	Samantha	Johns Hopkins University Applied Physics Laboratory
Spaeth	Stefan	Airbus Helicopters
Spinks	Brian	L3 Harris Corporation
Teel	Brandi	RTCA, Inc.

Last Name	First Name	Company Name
Vaupell	Mark	Federal Aviation Administration (FAA)
Voyzey	Erika	L3 Harris
Wikle	Jared	MIT Lincoln Laboratory
Wu	Sam	MIT Lincoln Laboratory
Zanlongo	Sebastian	Johns Hopkins University Applied Physics Laboratory
Zintak	Ben	Johns Hopkins University Applied Physics Laboratory