<u>**Special Committee 147**</u>

<u>**MINIMUM OPERATIONAL PERFORMANCE STANDARDS FOR TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEMS AIRBORNE EQUIPMENT**</u>

The 91st meeting of RTCA SC-147 and 60th meeting of EUROCAE WG-75 was held on 25 April 2019 via WebEx.

The following Leadership was present:

J. Stuart Searight	Co-Chairman, Federal Aviation Administration
Ruy Brandao	Co-Chairman, Honeywell, SWG Co-Chairman
Bill Booth	Co-Chairman, EUROCAE WG-75
Brian Ulm	Co-Chairman SWG
Charles Leeper	Co-Chairman TWG
Sheila Mariano	Government Authorized Representative
Donna Froehlich	Secretary, Aurora Innovations
Al Secen	Director RTCA, also representing Alex Engel (director EUROCAE)

<u>**Agenda**</u>

Thursday, April 25
1. Chairmen's Opening Remarks / Introductions
2. Anti-Trust Statement & RTCA/EUROCAE Policies
3. Approval of Minutes from 90th (7 Mar 2019) Meeting of SC-147
4. Approval of Agenda
5. Future Meeting Schedule
6. Review of ACAS Xa/Xo Do-385/ED-256 Change Proposals
    a. Overview of Categories of Change
    b. Review of Bench Test Scenario Corrections
    c. Review of Data Field Corrections/Clarifications for Coordination
    d. Review of Other Textual Corrections/Clarifications
    e. Review Scope of Changes and format of Change Document
7. Approval to FRAC DO-385/256 Change 1
8. Adjourn

Note: All presentations from the agenda items summarized below can be found on the RTCA Workspace (**http://workspace.rtca.org/kws**) in the SC-147 Traffic Alert & Collision Avoidance System area.

Agenda Item 1-5. – Opening Plenary Session

1. Chairmen's Opening Remarks / Introductions
   Mr. Stu Searight opened the meeting, thanking all attendees for joining us in this "off-cycle" e-Plenaray.
2. <u>Anti-Trust Statement & RTCA/EUROCAE Policies</u>
   Mr. Al Secen (RTCA) presented the Anti-Trust Statement and EUROCAE Policies that govern our MOPS development and technical exchanges. He represented Mr. Alex Engel (EUROCAE) regarding the scope and overlap of the sister-organization's policies. There were no questions, nor were there additions or corrections, from our RTCA and EUROCAE members.
3. Approval of Minutes From 90th (7 Mar 2019) Meeting of SC-147
   Mr. Stu Searight asked for comments/edits, none received. Minutes accepted and approved.
4. Approval of <u>Agenda for 25 April 2019</u>

   Donna indicated that the document number referenced in the agenda should represent the RTCA and EUROCAE document numbers. That is, DO-385 should actually refer to DO-385/ED-256. The EUROCAE document number was noted in the updated agenda, items 6 and 7.

5. Future meetings (discussed at the end of the Plenary)

Year	Dates	City	Venue	Host Organization	Focus
2019	June 11-13	Washington, DC	RTCA Headquarters (WGs w Plenary)	RTCA	ACAS Xu Technical Requirements in MOPS. FRAC Comment Resolution and approval of Change 1 for ACAS X MOPS
2019	September 17-19	Washington, DC	RTCA Headquarters (WGs w Plenary)	RTCA	ACAS Xu Technical Requirements in MOPS. FRAC Comment Resolution and approval of Interoperability MASPS
2019	December 3-5	Washington, DC	RTCA Headquarters (WGs w Plenary)	RTCA	ACAS Xu Pre-FRAC
2020	March 10-12	Washington, DC	RTCA Headquarters (WGs w Plenary)	RTCA	ACAS Xu
2020	May (TBD)				
2020	Aug (TBD)				

Mr. Stu Searight added there are plans for Face-to-Face Working Meetings with Plenary in May and August of 2020. The actual dates will be selected at our next Plenary 13 June 2019.

Agenda Item 6 Review of ACAS Xa/Xo Do-385/ED-256 Change Proposals

Prior to Ms. Donna Froehlich's presentation there was discussion about the format and depth of the Change Proposal /Change document presentation. It was agreed that the committee had been provided sufficient time to consider the Change Proposals. This meeting could discuss the proposals at a high level allowing for comments or questions on a change category or specific change proposal as the presentation progressed.

Ms Donna Froehlich presented a summary of the DO-385/ED-256 Change Proposals. A Breakdown of comments received is as follows:

10	Bench Test Updates: Xa-0216, Xa-0217, Xa-0218, Xa-0219, Xa-0221, Xa-0222, Xa-0223, Xa-0225, Xa-0226, Xa-0227
5	Coordination: Messages, SubFields/Bits Xa-0232, Xa-0233, Xa-0234, Xa-0235, Xa-0237
4	Edits Xa-0215, Xa-0231, Xa-0238, Xa-0240

Slides 4 and 5 presented each of the Change Proposals at a high level indicating the sections affected by each. Slides 6-9 organized the Change Proposals (CPs) by category of change; these categories tie to the underlying reason that the changes are needed. Ms. Froehlich indicated that CPs categorized as Bench Test contained changes that should better reflect timing observed while bench testing an ACAS X system and incorporate other small corrections that were not caught while developing test scenarios with simulation results. While summarizing the CPs in the Coordination category, Ms. Ann Drumm contributed that the new test proposed in CP Xa-0234 had been coordinated with the Combined Surveillance Committee; the same test would appear in our MOPS Change 1, as well as in their updated transponder MOPS. Ms. Drumm also shared that CP Xa-0235 and Xa-0237 provide explanatory text or notes which were suggested to the Coordination Working/Sub-Group as helping with readability. Ms. Froehlich summarized the CPs in the Edits category and asked Mr. Ruy Brandao for a quick characterization of (need for) CP Xa-0240. Mr. Brandao indicated that this CP was due to the fact that DO-385/ED-256 uses a different approach for assessing performance Surveillance and Tracking Module (STM) performance than previously with DO-185/ED-143; this CP provides some clarification notes on this testing.

With an overview of the CPs presented, Ms. Froehlich reminded the committee that the Change Proposals were posted in an ACAS Xa/Xo CP folder on the SC-47 Workspace (WKS) and made available for committee review in March for the Plenary at Hood River, and distributed as a single Change Proposal package earlier this week for preparation for this Plenary. She then asked if there were any questions or

concerns for discussion. After several seconds pause, Mr. Ruy Brandao commented: this is good. He noted: we have "another opportunity to comment during the FRAC period."

Ms. Froehlich transitioned to the Change 1 document with an overview of the scope and organization (slide 10). Ms. Froehlich stressed that each Section of DO-385/Ed-256 affected by 1 or more Change Proposals would be presented in its entirety and marked with strikethrough for deletions and highlighting for additions. This would make it easier for implementers to ensure that they have all the changes (for a section) in one place.

Overview of DO-385/ED-256 Change 1 Document

- Word document
- Overview of Change 1 document and primary reasons for changes
- Table mapping affected sections with types of changes
- Each affected DO-385/ED-256 section is presented separately as § 1.nn in the Change 1 Document
  Includes
  - Overview of desired changes; reason for changes
  - Visible changes:
    - Strike-through in red for deletions
    - Light Gray highlighting for additions

A subsequent question about reviewing Change 1, provided Ms. Barbara Kobzik-Juul an opportunity to share that the draft Change 1 has some embedded comments indicating the reason/need for her proposed changes to the test sections. Ms. Froehlich indicated that these comments would be retained for the FRAC version of Change 1.

Agenda Item 7 Approval to FRAC DO-385/256 Change 1

Ms. Froehlich's proposed FRAC schedule provided the transition to discussion on readiness to FRAC the Change 1 document. Ms. Froehlich stated that since several sections have change text from more than one Change Proposal, a little more time is needed to merge and proof the changes. She noted that merging the changes into each section will provide for a cleaner product for review and implementation.

Mr. Stu Searight asked for clarification on approach to present each section fully with the changes marked integral to that section included in the Change 1 document. Mr. Al Secen indicated that both he and Mr. Alex Engel approved of the Section-by-Section approach of presenting the changes with mark-up displayed. Each section containing changes from all Change Proposals that affect that section.

Mr. Searight recommended that committee members review the Change 1 document using the table on slide 11 as a reference. Ms. Donna Froehlich indicated that table would be included at the beginning of Section 1 of the DO-385/ED-256 Change 1 document. She added, the table will help in our internal proofing prior to releasing Change 1 for FRAC and could act as a "roadmap" of sorts to assist reviewers in identifying what Change Proposals impact each section.

RTCA DO-385/ EUROCAE ED-256
Proposed Changes Mapping

Section #	Section Title	Change Proposal #	Short Description
1.3.3.1	Future Coordination Schemes	Xa-0233	Update to terminology for future CAS use of CCCB
1.7	Glossary of Terms	Xa-0233	Update to Glossary for new CCCB terminology
2.1.12	Aural Annunciation	Xa-0215	Hysteresis around ownship alt; shall [2026]
2.23.8.3.2,9.2	Subfields in ME for A/C Operational Status Message	Xa-0233	Update to terminology for future CAS use of CCCB
2.23:8:3:2:9:2	Subfields in ME for Aircraft Operational Status Message	Xa-0237	CA Operational explanation/ note
2.23.8.3.1.14	RI Air-to-Air Information	Xa-0232	Update to RI bench test
2.23.9.3.1	Determination of Own Coordination Protocol	Xa-0232	Update to RI usage in coordination
2.23.9.3.1	Determination of Own Coordination Protocol	Xa-0235	OC M explanation
2.2.5.5.9	Receive State Vector Position	Xa-0238	nominal case update rate should be 2 Hz
2.4.2.4.1	Transmission of RA Report to Mode S Sensor	Xa-0216	If no RA issued, these are undefined; hence shouldn't be tested.
2.4.2.4.1	Transmission of RA Report to Mode S Sensor	Xa-0217	DF20 MB Field Contents table, msg timing, & note on bearing crossing
2.4.2.4.2	Transmission of RA Broadcast Interrogation	Xa-0218	RAC has to be 1000 instead of 0000 (because intruder VRC is set to 1)
2.4.2.4.3.1	Sense Selection and Communication	Xa-0219	In expected output (VRC=2 is correct,) since no change of sense: change CVC=1 to CVC=0 and VSB=7
2.4.2.4.3.1	Sense Selection and Communication	Xa-0221	DF=16 MV Field Contents: last row in table: ARA Strength should be 4
2.4.2.4.3.1	Sense Selection and Communication	Xa-0222	ARA Strength; Updates to RA type
2.4.2.4.3.1	Sense Selection and Communication	Xa-0223	If no RA present, don't test values in undefined fields; remove UF20 inputs and DF20 outputs.
2.4.2.4.3.3	ACAS X in Multi-Aircraft Conflict	Xa-0225	Adjust RA type and ARA field according to ADD output, correct most recent threat in TID field
2.4.2.4.3.4	Coordination Monitor	Xa-0226	Update T=28-30sec to T=29-31sec; clarify timing differences between Test Suite tests and bench testing
2.4.2.4.3.5	XPDR to ACAS X Interface & XPDR/ACAS X Throughput	Xa-0234	Transponder/ACAS X Throughput
2.4.2.4.3.7	Use of Rxd Collision Avoidance Coordination Capability	Xa-0227	DF=16 MV Field Contents; Coordination Reply Message table and ARA
2.4.2.4.3.7	Use of Rxd Collision Avoidance Coordination Capability Bits	Xa-0231	Use HEX instead of (base) 16 subscript
2.4.2.4.3.7	Use of Rxd CCCBs	Xa-0232	Update to RI definition
2.4.2.4.3.7	Use of Rxd CCCBs	Xa-0233	Update to CCCB bench test
3.4.4.1	Mode C surveillance flight test notes	Xa-0240	SWG clarifications on flight test

The Committee then discussed the proposed FRAC schedule (slide 12).

Proposed Review Schedule

- April 25   Overview of Proposed Changes
  Approve FRAC/OC of DO-385/ED-256 Change 1
- April 30   Release Change 1 & Commence FRAC/OC
- May 1-31   Open Comment Period
- May 31   Close FRAC/OC comment period
- May 28-Jun7   Adjudicate Comments
- June 11&12   Break-out for Comment Resolutions
- June 13   Approval Decision on DO-385/ED-256 Change 1

Discussion centered on the proposed FRAC period of May 1 – May 31. Mr. Secen indicated that for joint documents RTCA and EUROCAE usually require 45 day review period, but that it is possible to have a

reduced period for smaller documents. Mr. Searight thanked Mr. Secen for that, and said that if it is necessary, we would extend the FRAC period up to the June Plenary. Mr. Searight continued that it is important for reviewers to provide comments early and to coordinate with Ms. Froehlich so appropriate SMEs (of core requirements and of the proposed changes) can work with the commenter(s) and resolve the concern with explanation and/or edit. Mr. Searight offered that we would hold break-out sessions at the June Face-to-Face as appropriate for comment resolution that requires that level of attention.

Mr. Searight concluded that this approach should allow us to finish up any changes and propose approval of Change 1 at the June Plenary.

At this point, Mr. Searight moved that we go forward with FRAC as discussed. No objections or comments, and the move was accepted.

Agenda Item nn. Action Items Summary

- Ms. Donna Froehlich to coordinate Change 1 document and RTCA/EUROCAE release for FRAC on/about 30 April 2019
- Committee members to FRAC Change 1 document, identifying questions and comments early to allow time for discussion and resolution.
- Ensure there is time/space on the June Face-to-Face Agenda for Break-out session
- Mr. Al Secen to check with Mr. Alex Engel to verify date for closing of FRAC period.

Certified as a true and accurate summary of the meeting.

Co-Chairman   Co-Chairman

-S-   -S-
Mr. Stuart Searight Mr. Ruy Brandao
FAA   Honeywell

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