

**Special Committee 147**

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

The 92<sup>nd</sup> meeting of RTCA SC-147 and 61<sup>st</sup> meeting of EUROCAE WG-75 was held on 13 June 2019 at RTCA Headquarters, Washington, DC.

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
Sheila Mariano	Government Authorized Representative
Donna Froehlich	Secretary, Aurora Innovations
Al Secen	Director RTCA
Alex Engel	Director EUROCAE

**Agenda Thursday, June 13**

1. Chairmen's Opening Remarks / Introductions
2. Anti-Trust Statement & RTCA/EUROCAE Policies
3. Approval Of Minutes: 91<sup>st</sup> Meeting of RTCA SC-147/60<sup>th</sup> Meeting of EUROCAE WG-75 | 25 April 2019
4. Approval of Agenda: 92<sup>nd</sup> Meeting of RTCA SC-147/61<sup>st</sup> Meeting of EUROCAE WG-75 | 13 June 2019
5. Future Meeting Scheduling
6. Approval of ACAS Xa/Xo MOPS DO-385/ED-256 Change 1 for Referral to PMC
  - a. Comment and Resolution Review
  - b. Document Approval
7. Out-Brief of SC-147 Working Groups
  - a. Surveillance (SWG)
    - i. Change Proposal from Garmin regarding on-ground status
  - b. Threat (TWG)
  - c. Coordination (CSG)
8. Approval of Draft Interoperability MASPS To Enter FRAC/OC
9. European Validation Activities Status
10. Action Items Summary
11. 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. Stuart Searight opened the meeting, thanking all attendees.
2. Anti-Trust Statement & RTCA/EUROCAE Policies  
Mr. Al Secen (RTCA) presented the Anti-Trust Statement and EUROCAE Policies that govern our MOPS development and technical exchanges. Mr. Alex Engel (EUROCAE) indicated EUROCAE policies parallel those of RTCA. There were no questions, nor were there additions or corrections, from our RTCA and EUROCAE members.
3. Approval of Minutes From 91<sup>st</sup> (25 April 2019) Meeting of SC-147  
Mr. Searight asked for comments/edits, none received. Minutes accepted and approved.
4. Approval of Agenda for 13 June 2019  
Approved with two adjustments:
  - a. Working Groups to report out before discussion of the documents subject to FRAC, i.e., DO-385/ED-256 Change 1 and Interoperability MASPS DO-376/ED-264
  - b. Future meetings to be discussed at end of the day’s business; will remain item 5.
5. Future meetings, as discussed at the end of the Plenary ([see SC-147 Work Plan](#))

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 DO-376/ED-264
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	Review Progress on ACAS Xu; Present Approach to FRAC/OC
2020	June 1-4	Washington, DC	RTCA Headquarters (WGs w Plenary)		Refine Approach to FRAC/OC
2020	Aug (TBD)	N/A	e-Plenary	RTCA	Confirm ACAS Xu FRAC/OC

## 6. Out-Brief of SC-147 Working Groups (WG Leads)

### a) Surveillance Working Group (SWG – Jessica Lopez)

Ms Lopez summarized the topics and decisions made earlier in the week, SWG briefings are available in the folder [SWG 20190612 – Face-to-Face](#)

- Run 5.1 STM Changes
- TOO Analysis
  - High Priority outliers – IMM updates should address
  - Change 1 Comment Resolutions (brief later)
- SWG Joint with Radar/Tracker 228 subgroups
  - ACAS Xu validation analysis – Short term ADS-B quality issues (~ 20-30sec duration) causing validation failures – Mr. Walker has action to provide details and proposal for resolution
  - Action: PO to ensure PROVISIONAL validation state aligns with latest proposed validation text for DO-365 (text to be provided by Mr. Walker)
  - Discussion about ATAR to validate ADS-B at long ranges (outside RDR)
- ATAR Topics
  - Updated Observation Model
    - Bypasses intermediate coordinate conversion
    - Incorporates ownship attitude error
    - Tracker lag
  - Lag analysis + Example Test Encounters - Concern
  - Xu ATAR Accuracy Requirements Proposal

### b) Threat Working Group (TWG – Charles Leeper)

- Monitor Vertical Speed
- Variable Altitude Inhibits – When implemented, encountered some coordination hazards.. ...Prepping to support the Terminal Area concept where cutoff is different from the default 1000ft. provide a way to change a parameter input (based on an approved deviation for this) in order to support the changed cutoff  
Mariano: Want to know what the procedure is, and the values
- SC-228 Guidance Requirements – change guidance requirements and tie them to alerting Working closely with SC-228 WG-1 (and DAG) to get these right in time for our Xu MOPS FRAC
- Investigating re-introducing two RAs that had been deemed not possible based on anticipated UAS performance; vertical table would increase by about 10%  
Input requirement to Xu aircraft ability to climb and turn (dynamic info, but likely from look-up table based on aircraft current/loaded weight, airspeed, altitude, current turn/climb maneuver)

- New Transponder (new standard) with Xu will be required. Applicants who apply for US certification for the installation of an ACAS Xu will also need to install a new transponder to ensure the ACAS Xu meets its intended function. Older transponders limit the ACAS Xu performance and will not be acceptable for new installations. Ms. Mariano and Mr. Alex Engel clarified the difference for Military aircraft (self-certified) have to show safety level to operate in NAS/European Airspace

c) Coordination Sub-Working Group (CSG – Garfield Dean)

Mr. Garfield Dean deferred CSG presentation as it is addressed in the Interoperability MASPS presentation.

**7. DO-385/ED-256 Change 1 Document, FRAC/OC Status (Searight/Froehlich)**

Mr. Stuart Searight opened this topic with an overview briefing; he provided a Bottom-Line-Up-Front (BLUF) message that the committee leadership is proposing the committees (re-) FRAC/OC DO-385/ED-256 Change 1 UPDATED document.

Mr. Searight reminded the committee members that when we requested FRAC of the Change 1 document we requested comments on DO-385/ED-256 Test Suite sections. Leadership reminded committee members that the Test Suite sections were developed and included in the MOPS, with the experience of simulation results instead of bench tests to inform the expected results.

Mr. Searight continued that we some very beneficial comments were received from manufacturers and that one set of bench test results generated several comments against sections that did not appear in the FRAC/OC DO-385/ED-256 Change 1 document. SMEs and committee leadership agree that the Change 1 document should include the changes to DO-385/ED-256 proposed in these comments. Addressing these comments would require the addition of several sections to the Change 1 document.

Mr. Searight indicated that upon consulting with our RTCA/EUROCAE representatives on policy and processes, we determined that we would:

- Create an updated change 1 document with those sections and release a DO-385/ED-256 Change 1 UPDATED document for FRAC/OC.
- Hold onto all comments already submitted and resubmit them (new comment numbers) as part of FRAC/OC of the UPDATED document allowing the SMEs and other reviewers to ensure that any changes resulting from these comments have the opportunity for thorough review.

Mr. Searight indicated that SMEs would continue to work on these updated sections for the Change 1 document over the next few days so we would be able to release and complete FRAC/OC DO-385/ED-256 Change 1 UPDATED document in a timeframe that still supports our goal to have the updated Test Suite information in one place for reference by the TSO/ETSO later this year.

Ms. Donna Froehlich then briefed the committee on the [comments DO-385/ED-256 Change 1](#) received and the SMEs approach to resolving these comments. The [FRAC/OC Status briefing](#) also summarized the new FRAC/OC Timeline:

- 18 June: (re-)Open FRAC/OC Process
- 18 June -2 Aug (COB/EOD): 45 Day Comment Period
- 5 August: Review Comments; ID SMEs; Comment Resolution
- 8 August: Joint Plenary-Approve Change 1 PMC Submission
- 12 August: Submit to RTCA PMC for Review and Approval
- 13 September: Request Approval at PMC Meeting

Then Mr. Searight confirmed that an approval of the FRAC/OC comment resolution on 8<sup>th</sup> August would provide sufficient time for EUROCAE review and Approval; Mr. Alexander Engel confirmed that the EUROCAE Council has an open calendar for document approval and the Council's 4 week review and approval cycle would commence upon receipt of the committee approved the FRAC/OC activity for DO-385/ED-256 Change 1 UPDATED document.

Mr. Searight then asked for committee approval for DO-385/ED-256 Change 1 UPDATED document. Ms. Froehlich Moved for approval, Mr. Ruy Brandao seconded. Mr. Searight asked for comments/objections. With no objections voiced, the motion to reopen FRAC/OC was approved.

#### 8. [Interoperability MASPS FRAC Request](#) (Dean)

Mr. Garfield Dean requested that SC-147 consider there is sufficient development and definition in the Interoperability MASPS and that it is now ready for FRAC/OC. He highlighted several of the work activities that complement and reflect back into the concepts in the MASPS.

- Resolution of Pre-FRAC comments
- Further updates and refinements performed by the CSG
- Continued coordination of communications messages with the Combined Surveillance Committee
- Insights gleaned through the CAS HAZOP analysis

He summarized the progress since Pre-FRAC over the following points:

- [Judgement Calls](#) (Mr. Ken Carpenter presented on this topic)  
[Then, Mr. Dean resumed his presentation with recap on info presented at Hood River F2F March 2019]
- Completeness checks

- Lego Diagram
- HAZOP
- Scraps of paper!

Mr. Dean indicated that there are a few more editorial and consistency checks that the team desired, and once those checks are complete, would like to release the document for FRAC/OC. The committee approved FRAC of Interoperability MASPS DO-376/ED-264.

## Attendees

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