

Special Committee 147

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

The 89th meeting of the SC-147 was held on August 13th, 2018 at RTCA, Washington, DC. Ms. Sheila Mariano was present, although a Designated Federal Officer (DFO) is not required under the current charter. Ms. Karan Hofmann represented RTCA for this meeting.

J. Stuart Searight	Co-Chairman, Federal Aviation Administration
Ruy Brandao	Co-Chairman, Honeywell
Sheila Mariano	Designated Federal Officer Emeritus, Federal Aviation Administration
Donna Froehlich	Secretary, Aurora Innovations
Karan Hofmann	RTCA

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. – Opening Plenary Session

- a. Mr. Stuart Searight opened the meeting and presented the agenda
- b. Ms. Karan Hofmann welcomed the committee in behalf of RTCA. Ms. Hofmann noted participation in this joint committee required RTCA or EUROCAE membership. Then Ms. Hofmann summarized the RTCA Proprietary Policy, noted that RTCA oversight and EUROCAE Council need to approve any proprietary information included in an RTCA/EUROCAE standard. She also noted that any exclusionary discussion is prohibited in this forum and would be terminated.
- c. Mr. Alexander Engel and Mr. Bill Booth noted EUROCAE's proprietary information policy mirrors that of RTCA.
- d. Mr. Searight referred back to the agenda for this meeting – asked if WG-75 had any additional comments agenda item
- e. Discussion of future meetings was deferred to Xu Discussion and end of meeting.

**Agenda Item 2. – Final Comment Matrix Walkthrough –
Resolution of [MOPS Vol I Comments](#) and [MOPS Vol II Comments](#)**

Mr. Walter Bender presented the resolution status tables for both of the MOPS Comments files (Volume I and Volume II) and demonstrated that status for each of the MOPS Comments was marked as Complete.

Summary of Comments

	Number	Not Started	In Process	Complete
Non-Concur	8	0	0	8
High	128	0	0	127
Medium	210	0	0	209
Low	177	0	0	177
Editorial	411	0	0	411
N/A	0	0	0	0
Substantive	0	0	0	0
Total	934	0	0	932

Figure 1 Volume I Summary of Comments Resolution

Summary of Comments

	Number	Not Started	In Process	Complete
Non-Concur	1	0	0	1
High	24	0	0	24
Medium	36	0	0	36
Low	15	0	0	15
Editorial	33	0	0	33
N/A	0	0	0	0
Substantive	0	0	0	0
Total	109	0	0	109

Figure 2 Volume II Summary of Comments Resolution

Agenda Item 3. – Status of Non-Concur Comments

Ms. Donna Froehlich presented a summary of the Non-Concur comments. Then she walked through the acceptance email from each of the reviewers that submitted one or more Non-Concurs. Each email indicated acceptance of the resolution that was discussed at SC-147 Committee and/or Working Group meetings and subsequently implemented in the [MOPS documents released to the SC-147 Workspace on 10 August 2018](#). Ms. Froehlich called upon each commenter to confirm this acceptance. Mr. Garfield Dean accepted resolution of comment #31466, closing out that Non-Concur. Mr. Taji Shafaat was not available at this plenary, but multiple attendees confirmed that Mr. Shafaat had accepted resolution of comment #31146 at a previous Working Group Meeting. Mr. Bill Booth confirmed that he accepted resolution of comment #32121 at the previous plenary, held 18 May 2018. The remaining Non-Concurs, #60150-60155, were submitted by Mr. Randy Jacobson of Rockwell Collins and logged by Mr. Alexander Engel of EUROCAE. Ms. Froehlich presented Mr. Jacobson's email indicating resultant updates were acceptable. As Mr. Jacobson was unavailable, Mr. Dwight Unruh of Rockwell Collins and Mr. Alexander Engel confirmed that this was correct, all Non-Concurs could be considered complete and successfully closed-out.

Mr. Searight indicated since Non-Concurs were successfully closed-out, that next step is to ensure that all comments were addressed and reviewed. Segueing to the next agenda item.

Agenda Item 4. – Final Post July 24 MOPS Changes

Mr. Michael Petri stated that there were some comment resolutions that overlapped with or similarly affected edits from a previously implemented comment resolution. In this case, the agreed upon wording in the former, or earlier, resolution may not be wholly recognizable. Wherever practicable, the editors coordinated with Working Group leads in order to preserve the intent from both comment resolutions. Mr. Walter Bender concurred with Mr. Petri. Then, Mr. Petri and Mr. Bender asked if there were any questions or concerns regarding specific comments. The following were topics of discussion in ensuring that key comments did get their resolutions incorporated in the MOPS uploaded to the RTCA WKS on 10 August.

- Mr. Dean asked if the edit resolving comment #31443 was incorporated after the July revision of the MOPS. Mr. Michael Petri and Mr. Bender were able to confirm that this edit had been incorporated.
- Mr. Alexander Engel asked whether the Track ID correction related to comment #31129, #31130 was implemented in the ADD. Mr. Ian Jessen was able to verify that this should be in the ADD Change recorded as Xa-0214.
- Mr. Dwight Unruh asked whether comment #60185 (“General Pseudocode Issues”, rated High) was implemented. Mr. Bender indicated that the agreed upon notes were incorporated. Note: Section 2.2 of MOPS Volume I has high level description of the how Julia in Volume II as the Algorithm Description. The text describing how Julia could be used to examine data structures and vector sizes was one of the descriptive text sections that was finished up the previous week; it was incorporated in the ADD design notes (MOPS Vol II, K.3.6). This text was provided as an attachment to a 22 July 2018 email sent from Mr. Stu Searight to Mr. Randy Jacobson, other Rockwell Collins MOPS reviewers and the SC-147 leadership.

Agenda Item 5. – Final ACAS X MOPS Deliverables and Support Materials.

Mr. Stu Searight began discussion of some of the logistics that accompany a multi-volume MOPS with parameter and data tables, test suite description, encounter files and a julia image. These initial conversations are primarily to ensure that the materials needed for PMC review are identified and provided. However, this also sets the stage for generating and staging the MOPS package on/in the RTCA store front.

Mr. Neal Suchy indicated that supporting materials are FAA TCAS/ACAS X Program Office artifacts, they may be updated based on feedback from FRAC process, but after that may not be maintained. These items should not be supplied as part of the MOPS package. It was noted that the supporting materials do not have to be in the RTCA or the EUROCAE store.

Comment from Ms. Karan Hofmann was that the RTCA store front does not seem to have a filesize constraint the way that the RTCA WKS does; this is good, because RTCA can support the julia image and other large files that will be provided with the MOPS. Mr. Alexander Engel indicated that EUROCAE document store does not have a file-size constraint either.

Mr. Searight indicated that the committee leadership will continue to work with our RTCA and EUROCAE representatives to make sure the transition is as smooth as possible.

Agenda Item 6. – Final Test Suite Overview.

Ms. Barbara Kobzik-Juul provided an overview of the Test Suite users report TestSuiteDO385.pdf. Ms. Kobzik-Juul indicated the 422 encounters provided for the specified tests are divided into 7 test groups a table in the report provides a grouped list of encounters with the functionality tested by each of the groups. Ms. Kobzik-Juul noted that in the ADD, most of the algorithms are prescriptive and have to be implemented exactly the way they are described. The suggestive algorithms are identified in the MOPS Volume II, ADD. Ms. Kobzik-Juul also highlighted that due to the interaction of suggestive algorithms with the prescriptive algorithms, there are 13 branch tests that manufacturers will need to develop and execute in order to ensure the requisite full-branch coverage of testing.

There were no questions or further discussion.

Agenda Item 7. – Final MOPS Approval.

Mr. Searight raised the topic of formal approval of ACAS Xa/Xo MOPS and submission to RTCA PMC/EUROCAE Council. Ms. Donna Froehlich moved for approval. Mr. Stacey Rowlan seconded. There were no objections and the motion was sustained.

Mr. Neal Suchy asked for confirmation that the ACAS Xa/Xo MOPS would be identified as DO-385. Mr. Stu Searight and Ms. Karan Hoffman both indicated that this, ACAS Xa/Xo MOPS is will indeed be labeled as DO-385. Mr. Searight and Mr. Suchy noted that this is convenient since TCAS standard was DO-185, and ACAS Xa/Xo is DO-385.

Ms. Karan Hofmann indicated that the committee has one or two days to address any oversights that might be identified by reviewers examining the results of their comments. The RTCA editor will take care of blank pages and adjusting page breaks to eliminate orphan and widow lines. Anything that is of a technical nature must be addressed before the end of this week; the editor is waiting for the committee to say the MOPS document is ready. Mr. Alexander Engel indicated that this part of the process is the same for EUROCAE.

Ms. Hofmann continued: as of Monday, 20 August 2018, the PMC must have the baselined copy of the MOPS for their review so they may make their determination in their September meeting.

Agenda Item 8. – Next Steps.

a. RTCA/PMC Meeting

Ms. Karan Hofmann reminded the committee members: The DO-385 MOPS needs to be in PMC hands for review by Monday 20 August. Ms. Hofmann continued clarification on the editorial process: any alignment changes need to be addressed before the document is handed over to the RTCA and EUROCAE editing process(es). Ms. Hofmann asked the

leadership to confirm that the document is ready for the final editorial-layout process.

b. EUROCAE Approval Process.

Mr. Alexander Engel confirmed that he had what was needed for the comment resolution package for the EUROCAE Council. The full comment resolution sheets have been uploaded to the RTCA WKS, which he has access to, and he indicated that he also had a copy of all the emails/notes that the Non-Concurs were resolved to the satisfaction of the submitter. Mr. Engel continued that he is working with Mr. Al Secen, Ms. Karan Hofmann and others at RTCA to get the MOPS Vol II formatted for publication in A4 format [paper size, margins, etc].

Mr. Engel clarified that WG-75 will not wait for the results of the European validation before going for Council approval. WG-75 will take the final documents, have them approved by the Council and publish them. Based on this version the European validation will be performed for EASA.

Mr. Stu Searight indicated we are on-track to be published by RTCA and EUROCAE. Mr. Alexander Engel concluded “Thanks to all who have worked very hard all these years.” Ms. Karan Hofmann concurred “Well said, Alex.” And continued with her “Thank you” to the committee.

c. EUROCONTROL Validation Status, Schedule, etc.

Mr. Bill Booth spoke on status of the European Validation activities. He indicated they needed formal MOPS approval and a statement of acceptability in order to formally begin the validation. These are now in place. Mr. Booth continued: “Our customer is EASA” “We indicated we would have early results by the end of this year with Final results in first quarter of 2019. He also indicated he would be talking to EASA on 10 Sep 2019 as part of managing and statusing this process.

Agenda Item 9. – Other Business.

a. [Interoperability MASPS Status/Schedule](#)

Mr. Garfield Dean presented indicated that the Coordination Tiger Team is working on the Interoperability MASPS, and that the draft document is in good shape for review by the rest of the Xu Working Group at the next Face-to-Face and Plenary session. In fact, The CTT will be meet on October 15th at RTCA to perform a content check prior to discussion at the working sessions and plenary on subsequent days.

The plan is to have SC-147 to approve (or at the least, approve in principle) to refer the document to EUROCAE Council for approval to publish.

Mr. Alexander Engel noted that the TORs will need updates to better reflect key and target dates for this effort. Mr. Dean concurred.

b. [ACAS Xu Meeting Schedule](#)

Mr. Charles Leeper presented the next Face-to-Face meeting dates below:

Year	Dates	City	Venue	Host Organization	Focus
2018	October 16-18	Washington, DC	RTCA Headquarters (w Plenary)	RTCA	ACAS X/Xu
2019	March 5-7	TBD	TBD	TBD	TBA (potentially: ACAS Xu/DAA)
2019	June 11-13	Washington, DC	RTCA Headquarters (w Plenary)	RTCA	ACAS Xu Technical Requirements in MOPS
2019	September 17-19	Washington, DC	RTCA Headquarters (w Plenary)	RTCA	ACAS Xu Technical Requirements in MOPS
2019	December * Dates TBD	Washington, DC (tentative)	TBD	TBD	ACAS Xu Pre-FRAC

*Currently, the most likely option is December 3-5, 2019 at RTCA Headquarters; but this has not been discussed within the ACAS Xu Working Group, nor within the Tiger Teams.

Mr. Stu Searight noted that in preparation for the October plenary, there will be a little restructuring within the committee to better support Xu. He continued indicating that the chairs would work with our RTCA representative along with the Working Group and Tiger Team leadership to figure out what whether the organizational or documentation structure requires adjustments prior to the next Face-to-Face (F2F) and Plenary session at RTCA on 16-18 October 2018.

Mr. Searight then checked to see if there were other comments or concerns that should be discussed with the other members that are in attendance.

Mr. Andy Zeitlin noted that the ACAS Xa/Xo Safety Report V2.1 would be released by the end of the week.

There were no additional comments; the meeting adjourned at 11:58.

Certified as a true and accurate summary of the meeting.

Co-Chairman

Co-Chairman

-S-

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Mr. Stuart Searight
FAA

Mr. Ruy Brandao
Honeywell

Attendance
SC-147 Plenary #89

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