Special Committee 147

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

The 94th meeting of RTCA SC-147 and 63rd meeting of EUROCAE WG-75 was held on 19 September 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, September 19

1. Chairmen's Opening Remarks / Introductions
2. Anti-Trust Statement & RTCA/EUROCAE Policies
3. Approval Of Minutes:
   - 92nd Meeting of RTCA SC-147/61st Meeting of EUROCAE WG-75 | 13 June 2019
   - 93rd Meeting of RTCA SC-147/62nd Meeting of EUROCAE WG-75 | 8 Aug 2019
4. Approval of Agenda: 94th Meeting of RTCA SC-147/63rd Meeting of EUROCAE WG-75 | 19 Sep 2019
5. Future Meeting Scheduling
6. Approval of Draft Interoperability MASPS to send to PMC pending comment resolution.
7. Out-Brief of SC-147 Working Groups
   a. Surveillance (SWG)
      - Change Proposal from Garmin regarding on-ground status
   b. Threat (TWG)
   c. Coordination (CWG)
   d. sXu
8. Update from FAA Cert/EASA on TSO and rulemaking status for ACAS Xa/Xo
9. European Validation Activities Status
10. Action Items Summary
11. Adjourn Plenary

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 94th Plenary of SC-147, 63rd meeting of EUROCAE WG 75. He noted that sXu working meetings were to follow the Plenary this afternoon and tomorrow morning. Even though this joint committee is not actively working on these standards, it is important to get broad feedback from the wider community in this nascent period.
   Mr. Searight noted that the August e-Plenary approved DO-385 Change 1. Subsequently, on Sept 12, 2019 the RTCA PMC and EUROCAE Council approved the DO-385 Change 1. Many thanks to editors, contributors and all those who shepherded the document through the approval process.

2. Anti-Trust Statement & RTCA/EUROCAE Policies
   Mr. Al Secen reviewed the anti-trust statement and basic committee policies. Then, Mr. Alex Engel thanked RTCA for hosting meeting and reinforced that EUROCAE has the same anti-trust policies as RTCA. Mr. Engel then reviewed the reciprocal membership agreement between RTCA and EUROCAE.

3. Approval of Minutes:
   • 92nd Meeting of RTCA SC-147/61st Meeting of EUROCAE WG-75 | 13 June 2019
   Mr. Searight explained that we hadn't provided sufficient review time between June and August Plenary, so these minutes are up for approval today. Mr. Searight asked for questions comments on the June minutes, as there were none, he asked for approval. Mr. Charlie Leeper moved for approval. Mr. Stacey Rowlan seconded the motion. Then, the committee approved the June Plenary minutes.
   • 93rd Meeting of RTCA SC-147/62nd Meeting of EUROCAE WG-75 | 8 Aug 2019
   Mr. Searight asked if there were any questions or comments on the August Plenary minutes, as there were none, he asked if the committee would approve the minutes. Mr. Walter Bender moved the August Plenary minutes be approved; Mr. Bill Booth seconded. The committee approved the minutes from August Plenary.

4. Approval of Agenda: 94th Meeting of RTCA SC-147/63rd Meeting of EUROCAE WG-75 | 19 Sep 2019
   There were no additions or significant corrections to the agenda from committee members. Mr. Searight did point out that the Coordination group will be taking more time to address FRAC comments, so will not be proposing approval of the Interoperability MASPS at this meeting.

5. Future Meeting Scheduling
   (see SC-147 Work Plan from June 2019)

Year	Dates	City	Venue	Host Organization	Focus
2019	December 3-5	Washington, DC	RTCA Headquarters (WGs w Plenary)	RTCA	ACAS Xu Pre-FRAC Coordination with sXu efforts
2020	March 10-13	Phoenix, AZ	Drury Inn and Suites, Happy Valley (WGs w Plenary)	ACSS w/ RTCA WebEx	Review Final Performance of ACAS Xu; Approve FRAC/OC of ACAS Xu MOPS Coordination with sXu efforts
2020	June 1-4	Washington, DC	RTCA Headquarters (WGs w Plenary)	RTCA	Address ACAS Xu FRAC/OC comments Approval of ACAS Xu MOPS Coordination with sXu efforts
2020	Sep 14-17	Washington, DC	RTCA Headquarters (4th floor) [Joint w SC-228 on 9th floor]	RTCA	WGs w Plenary Final ACAS Xu Acceptance DAA Coordination Coordination with sXu efforts

6. **Interoperability MASPS FRAC** (Dean)

Mr. Garfield Dean opened his discussion by stating that the FRAC of the Ineroperability MASPS began 8 July with comments period closing 23rd August. A total of 245 comments were received with 35 rated as High and 7 Non-Concur. Mr. Dean continued that one Non-Concur was due to a misunderstanding of the rationale for a requirement and three others have been attributed to the complexity off the document. The CWG agreed to regroup technical issues within the document to make it clearer and to provide additional text to clarify the use of CCCB data. There was some discussion regarding the requirement to get written concurrence of resolutions to High and Non-Concur comments and the administrative steps required if any remain when the document goes to the council for approval.

At this time, approximately 20% of High and Medium comments completed. However, about half of the time spent so far has been on Non-Concurs and the CWG/CSG estimates it will need at least 8 more Webex sessions to complete High and Medium comments. He then noted that the group still needs to continue working on the Non-Concurs with at least four more Webex needed to address the technical and restructuring work needed.

Mr. Dean then reviewed the CWG schedule for resolution of the Interoperability MASPS comments, anticipating delivery around end of calendar year 2019.

Mr. Alex Engel congratulated the CWG on completing FRAC of the Interoperability MASPS. He noted that this is a complex topic that needed a lot of input from various SMEs and he was impressed with the quality of the work as well as the depth of the comments. He indicated confidence that the team would be able to convey the MASPS though the joint committee approval and PMC/Council approval processes.

7. Outbrief of SC-147 Working Groups (WG Leads)

   a) Surveillance Working Group (SWG – Jessica Lopez)
      Ms. Lopez summarized the topics discussed and decisions made earlier in the week, SWG briefings and breakout notes are available in the folder SWG 20190918– Face-to-Face. Topics she presented on were a summary from her breakout notes:
      - Ms. Lopez indicated: Mr. Jared Wikle and Ms. Kara Breeden provided a presentation on Degraded Surveillance analysis; reviewed the simulation results and highlighted results regarding specific degraded surveillance concerns.
      - Ms. Lopez then summarized the ATAR Requirements presentation by Mr. Adam Panken and herself. She highlighted some of the discussion. (For more details, please reference the SWG meeting notes.)
      - Ms. Lopez indicated there was good progress with the Correlation Analysis efforts by MIT Lincoln Labs and JHU Applied Physics Labs.
      - Ms. Lopez indicated there was good feedback on the Ownship Input Measurements and TOO Analyses

   b) Threat Working Group (TWG – Charles Leeper)

Mr. Charles Leeper presented the TWG summary of the group's efforts on getting the Xu MOPS ready for pre-FRAC. He indicated that the working group completed the review of the TRM (V5R0) Algorithm Description Document. The group also completed major MOPS section reviews. Mr. Leeper then provided several topic areas that required particular attention: ACAS Xo, Monitor, and Appendix O. He then highlighted the approach and progress in these areas. Mr. Leeper also reviewed TWG approach/coverage of the MOPS Test Sections.

Finally, Mr. Leeper thanked the reviewers for their hard work and attention to detail, and transitioned to a discussion of the ACAS Xu MOPS schedule to get to publication. Mr. Leeper reviewed the ACAS Xu pre-FRAC/FRAC timeline for 2020 and asked Mr. Lester to share his schedule correlation between SC-228 and SC-147. Mr. Leeper highlighted that we anticipate FRAC of the ACAS Xu MOPS starting mid-March 2020 with comment period closing mid-April 2020. The committee Face-to-Face and Plenary scheduled for the first week of June would focus on getting consensus agreement on the resolution approach, and likely having breakout sessions to address specific comment resolution.

c) Coordination Sub-Working Group (CSG – Garfield Dean)
Mr. Garfield Dean's presentation was covered by the status of the Interoperability MASPS status.

8. Update from FAA Cert/EASA on TSO and rulemaking status for ACAS Xa/Xo
Ms. Sheila Mariano provided an overview and status of the Regulatory Products and Schedule for SC-147. She noted that the Technical Standard Order (TSO) for ACAS X (Xa/Xo) is in FAA Review Cycle and should be out for public comment by/in November for December publication. Ms. Mariano indicated she would share an announcement for commenting on the TSO. [Secretary's note: TSO comment period announcement.] The Advisory Circular is currently on schedule for publication in January of 2021. Ms. Mariano also reviewed the key dates for ACAS Xu starting in May of 2021.

9. European Validation Activities Status
Mr. Bill Booth presented the status of the European ACAS Validation effort. Mr. Booth's presentation reminded us of technical reasons why the European oversight requires their own validation and some of the difficulties in getting their simulated environment updated and integrated with ACAS Xa/Xo. He then walked us through some of the results where European simulations provide different results from the previously released Metrics Matrix. – Überlingen and AVAL results were among these differences. – Mr. Booth then closed with the following conclusions on the effort:
- Global safety results of the new studies are mostly achieving statistical significance
- Work is ongoing
- Operational analysis is ongoing
- Implications of fewer ACAS Xa alerts in very close encounters needs to be agreed
- Regular technical communication between the US and Europe
- Interpretation of technical results is important
- Comparison with US results should be insightful
- SESAR Acceptability Criteria – will be intelligently interpreted

10. Action Items Summary

Reviewed schedule; confirmed ACSS hosting of Face-to-Face Meetings in March 2020. Coordinated with SC-228 meeting calendar so we could schedule the September 2020 Face-to-Face to be held jointly. – SC-228 will meet 14-17 September 2020 on the 9th floor, while SC-147 has the 4th floor reserved at RTCA for the same week.

Before adjourning the meeting, Mr. Searight mentioned that the SC-147 Terms of Reference (TORs) now include language to allow the committee to be informed and provide feedback on operational concepts and technical work being done for ACAS Xu for small UAS (ACAS sXu). The SC-147 leadership then invited participants to return to this meeting space in the afternoon and subsequent morning to receive an overview of the ACAS X small UAS (ACAS sXU) efforts to harmonize with ASTM standards efforts.

11. Adjourn Plenary

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