

Special Committee 147

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

The 96th meeting of RTCA SC-147 and 65th meeting of EUROCAE WG-75 was held on 21 January 2020 as a Virtual (WebEx only) Plenary hosted by RTCA Headquarters, Washington, DC.

The following Leadership was present:

J. Stuart Searight	Co-Chairman, Federal Aviation Administration
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 Tuesday, 21 January 2020

1. Chairmen's Opening Remarks / Introductions
2. Anti-Trust Statement & RTCA/EUROCAE Policies
3. Approval Of Minutes From 95th Meeting Of SC-147/ 64th Meeting of WG-75 (5 December 2019)
4. Approval Of Agenda
5. Future Meeting Scheduling
6. Review Of Comments and Resolutions form initial FRAC/OC Process for the Interoperability MASPS
 - a. Overview of restructuring and new materials
 - b. Review of comment adjudication
 - i. Responses to Highs and Non-Concurs
 - ii. Address resolution of Medium, Low and Editorial comments
7. Approval for a 2nd FRAC/OC of Interoperability MASPS
8. Action Items Summary
9. Close

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 and Mr. Bill Booth opened the meeting welcoming the attendees. Mr. Searight expressed regrets from Mr. Ruy Brandao that he is unable to attend this Plenary session; Mr. Brandao expressed confidence in the Committee to carry-on despite his absence. Then, Mr. Searight summarized the intent of this Virtual Plenary is to get a full brief from CWG on the CAS Interoperability MASPS, to determine if it was sufficiently mature and complete to be submitted for FRAC/OC, and to seek approval for proposed updates to the committee’s Terms of Reference that would add MOPS for ACAS sXu into our work plan.

2. [Anti-Trust Statement & RTCA/EUROCAE Policies](#)

Mr. Al Secen reviewed RTCA Anti-Trust Policy and Proprietary Policy; inclusion of proprietary material must be briefed to, and approved by, the PMC. Then, Mr. Alex Engel reviewed the EUROCAE policies indicating they are very similar with clarification on how the EUROCAE Council approves any proprietary material Participation in RTCA Committees & EUROCAE Working Groups was also reviewed. Mr. Engel noted that typically Plenaries for EUROCAE Working Groups are closed, but since this is a joint meeting of SC-147 and WG-75, and RTCA Plenary meetings are open. Therefore, this Plenary is an open meeting for SC-147 and WG-75.

3. Approval of [Minutes From 95th \(5 December 2019\) Meeting of SC-147/ 64th Meeting of WG-75](#)

Mr. Wes Olson Moved to approve minutes; Mr. Bill Booth seconded. No objections. Minutes approved as distributed.

4. Approval of [Agenda for Plenary of 21 January 2020](#)

Mr. Searight quickly reviewed the agenda for this Plenary. There were no proposed edits or additions.

Then Mr. Searight noted that [CAVEAT Models and Algorithms - NLR-CR-2018-429 \(draft\)](#) effort was recently uploaded to the CSG portion of the SC-147 WorkSpace and commented that the report looks informative. Mr. Garfield Dean indicated it was a draft report provided as a reference to the CSG team while working on the CAS Interoperability MASPS. Draft document is for limited distribution, which is why it was shared with the CSG Working/Sub-Group.

5. Future Meeting Scheduling (deferred to end of meeting)

- a. March Plenary
- b. April possible Virtual Plenary
- c. June Plenary in Western Regional Office
- d. July Resolution of Xu MOPS

- e. September sXu-focused F2F (may not need Plenary at this time)
- f. December (8-10) 2020 Face-to-Face at RTCA (may include a Plenary session)

Year	Dates	City	Venue	Host Organization	Focus
2020	March 10-13 ◊ Mon, Mar 9 – CSG	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	April TBD**	Virtual	WebEx	RTCA	Virtual Plenary to Approve updated/FRACed/OCed Interoperability MASPS for CAS**
2020	June 1-4	Seattle, WA*	FAA Western Regional Office* (WGs w Plenary)	RTCA	Address ACAS Xu FRAC/OC comments Approval of ACAS Xu MOPS Coordination with sXu efforts
2020	July TBD**	Virtual	WebEx	RTCA	Virtual Plenary to Approve ACAS Xu MOPS**
2020	Sep 14-17	Washington, DC	RTCA Headquarters (4 th floor)	RTCA	WGs Final ACAS Xu Acceptance DAA Coordination with sXu efforts
2020	Dec 8-10	Washington, DC	RTCA Headquarters	RTCA	WGs (w Plenary?) sXu focus
◊ CSG assess and assign FRAC/OC comments (on CAS Interop MASPS) on 9 March @ L3/Harris; members/attendees must “pre-register” to be included on visitor list.					
* Updated venue, see email and visitor information					
** If needed, Virtual Plenaries will be scheduled in/about April and July for Document approval subsequent to FRAC/OC.					

Item 6. Review Of Comments and Resolutions from initial FRAC/OC Process for the Interoperability MASPS

Mr. Garfield Dean began by providing an overview of restructuring that the CWG/CSG performed. He added that in order to address some of the more significant comments, new materials were incorporated for clarification. In one instance an implied requirement was clarified as a “shall” statement and provided an explicit requirement number.

Review of comment adjudication discussed the Working Group's Responses to comments rated as High as well as the Non-Concurs. Then, Mr. Dean summarized the changes due to resolution of Medium, Low and Editorial comments

Mr. Dean led a discussion on the comments resolution. He noted the Non-Concur from SAAB still is outstanding. He added that editorial comments regarding page numbers (primarily of attachments) are still in-process as part of preparation for the CAS Interop MASPS FRAC/OC 2. Then Mr. Dean indicated an updated roster would be included after the upcoming (2nd) FRAC/OC.

Item 7. Approval for a 2nd FRAC/OC of Interoperability MASPS

Mr. Garfield Dean moved for approval of FRAC/OC; Mr. Charles Leeper seconded the motion. There were no objections nor requests for discussion. The motion was Approved by Committee.

Item 8. Approval of ToRs and revised schedule

Mr. Searight presented the updates in the proposed [Terms of Reference for SC-147](#), revision 18. First, Mr. Searight indicated the proposed date for CAS Interoperability MASPS Approval by PMC is now September 2020. Mr. Searight noted the document should be ready earlier, but by specifying September 2020 (instead of June 2020) the Committee has some flexibility to submit an approved document ahead of the delivery date published in the TORs.

Mr. Searight continued by presenting the addition of scope for collision avoidance for small UAS. ACAS sXu will provide a DAA capability for smaller UAS (sUAS), which are outside of the scope of the current Phase 2 SC-228 DAA MOPS, and operating Beyond Visual Line of Sight (BVLOS). ACAS sXu is designed to be flexible in adapting to airspace beyond the existing Part 107 restrictions. It is complementary to the UAS Traffic Management (UTM) concept, but can also support operations outside of UTM if allowed. ACAS sXu allows for various equipage combinations; the logic as well as surveillance sources can either be located entirely on ownship, entirely on the ground (with avoidance commands uplinked to the vehicle) or split between ownship and the ground. There was no diverging opinion and the scope of the sXu effort was accepted.

Mr. Searight indicated that Special Committee 147 would coordinate the review and comment processes for ACAS sXu MOPS with Special Committee 228, and specifically with its DAA Working Group (WG1). Mr. Al Secen raised possibility of new or amended ISRA for SC-147/SC-228. Mr. Searight: we thought continuing the existing relationship should be sufficient and since we are not anticipating formal deliveries, may not be required. Mr. Searight took the action to coordinate with SC-228 and see if there was need/desire for an ISRA for the continuing coordination. As a level-set for this position, Mr. Searight and Mr. Bender did a quick review of sXu milestones and noted these were discussed with SC-147 (& SC-228) in December F2F/Plenary. Highlighted in these sXu milestones are

- mid-Late 2021 in Pre-FRAC
- April 2022 FRAC/OC for sXu
- May/June 2022 Plenary to address FRAC/OC comments
- Early Aug 2022 Delivery to PMC
- Sep 2022 PMC approval and subsequent publication

Then Mr. Leeper and Mr. Searight reviewed ongoing assessments for ACAS Xu: As ACAS Xu MOPS is integrated into the US and European airspace we expect to examine operational performance and address any effects on Air Traffic Management. Summarizing, the goal of this continued analysis and support is to analyze the effectiveness and performance from both safety and operational perspectives to assess if the

ACAS Xa/Xo, Xu and sXu systems are performing as expected and determining if there are areas of these systems that should be improved.

Mr. Alexander Engel, mentioned that at a recent TAC we brought up support of sXu; EUROCAE will need to determine whether WG-75 or WG-105 should participate with the sXu effort. Additionally, the Council may determine that the effort is primarily US centric, decide to defer participation at this time. We will continue this evaluation upon approval of ToRs.

Mr. Randall Jacobson indicated a concern for the ACAS sXu scope. He stated that obstacles like buildings and cranes must be part of smaller UAS solution and asked if anyone is asking for this.

Mr. Searight confirmed that terrain and obstacles were discussed at the December Face-to-Face meeting – He then deferred to Mr. Neal Suchy or Mr. Walter Bender to indicate where this fits. There was a comment that there are Terrain/Obstacle systems under development and testing. Mr. Suchy responded that his Program Office is investigating interoperability with other systems – He reminded committee members that an sXu MOPS will be minimums and other systems could be interfaced based on developer’s or integrator’s needs. Mr. Olson added that if our community wants something like this, it could be added to scope, would require change to ToR and scope. He continued, indicating that this would need additional commitment from other SC-147 stakeholders also. Then Mr. Jacobson asked if there is an expressed desire for this capability. Mr. Olson responded: Yes, Operators are looking for traffic avoidance system that can consider obstacles. Mr. Suchy added: there is some expressed need for capability during consideration of the Notice of Proposed Rule Making (NPRM). Then, Mr. Bender indicated terrain and obstacle avoidance is a research area that we are taking into account. Mr. Jacobson responded that he wants to make sure that whatever we define is something that people actually want. Mr. Bender and Mr. Suchy responded in kind: We are taking that kind of feedback into consideration as we explore this further.

Then Mr. Jacobson expressed there may be a desire from some integrators to use the same sensors for obstacles as used for the CAS. Mr. Olson indicated this is something that needs to be explored further. He indicated that some sensors used to identify power lines may not have the same performance requirements as sensors designed to sense and identify aircraft. M. Olson added that surveillance [hardware, firmware, and/or algorithms] may be designed and/or tuned for specific functions and may not be suitable for some other detection/identification functions. Mr. Suchy indicated that Mr. Jacobson’s concerns are already part of the considerations for sXu; he referred to the [ACAS sXu White Paper](#) that Mr. Bender recently shared with SC-147 and ASTM members of sXu Working Group. Mr. Silbermann added that we are coordinating with other communities to make sure we have a holistic and viable approach. Mr. Randy Jacobson responded, “Sounds like you are doing all the right stuff.

Mr. Searight asked if there were any questions regarding the work ahead for small UAS. He continued: This is the right time to ask questions and join the sXu working group. Then, Mr. Searight moved that the Committee approve the TORS with revisions and submitting to PMC Pre-FRAC. Mr. Wes Olson seconded and the committee accepted the TORs as presented.

NOTE: Reviewed meeting schedule (see above)

Item 9. Action Items Summary

- Ms. Donna Froehlich to Post comment tracking spreadsheet from initial FRAC/OC of Interop MASPS - Complete: 21 January 2020

- Mr. Stu Searight and Mr. Al Secen to Submit TORs to PMC (for approval March 26)
- Mr. Searight to reach out to SC-228 and see if there was need/desire for an ISRA for the continuing coordination.
- Ms. Donna Froehlich to re-post info on June Plenary at or after the March Plenary ([March Plenary logistics information](#))

Item 10. Adjourn Plenary

Mr. Garfield Dean moved to adjourn the Plenary; Mr. Charles Leeper seconded the motion. The meeting was adjourned.

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