

RTCA- 228
Summary of Plenary #39 RTCA Paper No. 228-23/SC228-113
HYBRID MEETING
9:00 AM EST, October 20, 2023

The thirty-ninth plenary of RTCA Special Committee 228 was called to order by SC-228 Co-Chair, Brandon Suarez at 9:00 AM EST on October 20, 2023 at RTCA headquarters in Washington, D.C. and using WebEx audio and web conferencing.

1. Agenda Item #1- Call to Order: Welcome
 - 1.1. Brandon Suarez, co-chair called the meeting to order and stated the purpose for today's plenary through a review of the published and proposed agendas.
 2. Agenda Item #2- Review RTCA meeting guidelines
 - 2.1. Brandi Teel, RTCA Program Director, welcomed everyone.
 - 2.2. Brandi reviewed the Anti-Trust Policy, the Proprietary Policy and the RTCA Committee Participation Membership Policy.
 - 2.3. Brandi also briefed some meeting tips to ensure a successful virtual meeting.
 - 2.4. Brandi then briefed the online self-rostering feature. Thank you to all who self-roster!
 3. Agenda Item #3- Opening Remarks / Introductions
 - 3.1. Went around the room and phone, and introduced participants and companies.
 - 3.1.1. 21 in person, ~50 online.
 - 3.2. Participants on the phone stated their names and organizations, and attendance is noted in Appendix A.
 - 3.3. Brandon S. overviewed the SC-228 leadership team.
- NOTE:** Both WG1 and WG2 are looking for secretaries to fill open positions. Please reach out to anyone on committee leadership if you are interested in this opportunity.
4. Agenda Item #4- Review and Approve the agenda
 - 4.1. Agenda Item #10 (EUROCAE WG-105 Update) and #12 (V2V Update) were removed from the plenary agenda.
 - 4.2. No walk on agenda items.
 - 4.3. Brandon S called for a motion to approve the agenda. Marv Hammond moved to approve the agenda, Randy Jacobson seconded. No objections, agenda approved.
 5. Agenda Item #5 - Approve meeting minutes from Plenary Meeting #38
 - 5.1. Andrew Videmsek, WG-4 secretary, stated they received no comments for update/revision.

- 5.2. Andrew V called for a motion to approve the minutes. Marv Hammond moved to approve the minutes. Steve Van Trees seconded. No objections, minutes approved.
6. Agenda Item #6 - Schedule review – high level overview of upcoming document work that remains for 2022-2023
- 6.1. Andrew V provided an overview of the SC-228 schedule.
- 6.2. The schedule will be updated based on the plenary presentations and uploaded to the schedule folder on AerOpus.
7. Agenda Item #7 – WG-1 Update
- 7.1. Fabrice Kunzi provided the update for WG-1.
- 7.2. WG-1 met jointly with SC-147 for the majority of the week.
- 7.2.1. Primary focus with SC-147 was finalizing DO-398A to exit FRAC.
- 7.2.2. Two non-concurs received on DO-398A. Both resolved this week and accepted.
- 7.2.3. The working group expects resolutions to be implemented and completed in the next 2 weeks, aim is to time have the document to the PMC by the December PMC meeting.
- 7.2.4. Fabrice K called for a motion to exit FRAC on DO-398A. Regdy Caicedo moved to exit FRAC on DO-398A. Mark Reed seconded.**
- 7.2.4.1. Don Nellis raised a concern about a third non-concur that he provided that was not listed.
- 7.2.4.2. WG-1 accepts the proposed resolution to the non-concur presented by Don Nellis. Don Nellis approves this resolution.
- 7.2.4.3. Motion approved.**
- 7.3. WG-1 has been identifying areas in DO-365C that need updating. The intent is for the D revision to be the last revision to DO-365 for a while. The goal is to identify everything that needs to be updated now so that scope does increase during the revision processes.
- 7.3.1. Fabrice requested that WG-1 members review the list of identified update items (see plenary slides) and reach out to WG-1 leadership (Fabrice K and Don Walker) if there are any concerns.
- 7.3.2. One goal of the D revision to DO-365 is to develop a method in which a DAA equipped aircraft can use information from aircraft equipped with non-certified surveillance sources (e.g., an aircraft with FLARM) by enabling the ownship to validate the information.
- 7.3.3. Brandon S asked if the DO-365D timeline aligns with the SC-147 ACAS Xr MOPS timeline.
- 7.3.3.1. Randal Guendel stated that FRAC for ACAS Xr is scheduled for publication in 2025. Regdy C stated that the DO-365D revision should be completed prior to the ACAS Xr MOPS and the ACAS Xr MOPS will be able to use the updated DO-365D MOPS.

- 7.3.3.2. Don Walker noted that DO-365D would like to reference the upcoming ACAS Xr MOPS but that document will still be in development and will not have a DO number. Brandon S. asked if these two documents should enter FRAC at the same time. Don W stated the group can have a DO-365D RAC following completion of the document to finalize the requirements but delay the FRAC until the ACAS Xr MOPS enters FRAC so that the documents can undergo FRAC at the same time.
- 7.3.3.3. Fabrice noted that following the completion of DO-365D, WG-1 has no work to do on DO-365 for the following 3 to 9 months. After the publication of DO-365D the group can take a break from DO-365 and support the surface operations MASPS.
- 7.4. Fabrice K noted that WG-1 has identified significant interest in updating DO-366A to support ACAS Xr and Xu.
 - 7.4.1. Updates include increasing ownship maximum speed up to 291 KTAS for Class B DAA systems.
 - 7.4.1.1. Don W. noted that this will require updates to the encounter models and that the TCAS program office does not have funding to update the models. Randal G noted that he does not believe that the program office is not the only ones who can update the encounters.
 - 7.4.2. Fabrice K called for a motion to request the PMC add a revision to DO-366A to the SC-228 TOR. Jim Davis moved that a request to the PMC should be made requesting a revision to DO-366A be added to the SC-228 TOR, Stacy R seconded. No objections, motion approved.**
- 7.5. DO-381A was delivered to RTCA and it will be delivered to the PMC by November 4th.
- 7.6. Fabrice noted that this week included a breakout meeting to discuss an M:n working paper.
 - 7.6.1. This working paper is scheduled to enter RAC in January 2024
 - 7.6.2. This is an internal working paper, the group is not intending to publish it outside of RTCA.
 - 7.6.3. Mark Reed asked if the non-published working paper can be used as justification to update the TOR in the future to develop a document around it.
 - 7.6.3.1. Don W stated that the next step following the working paper would be to develop OSED material to describe the M:n operational scenario. If the special committee agrees with the working paper content, new OSED material would be added to DO-398 as a revision. The reason the group is pursuing a working paper instead of including the material directly in DO-398A as part of the current revision cycle is because the working group did not feel the content was ready for DO-398A.

8. Agenda Item #8 – WG-2 Update
 - 8.1. Amelia Mahan provided the briefing for WG-2.
 - 8.2. Amelia M. provided the current WG-2 schedule and the work products currently being developed.
 - 8.3. DO-377B FRAC started in August and 976 comments were received. 6 non-concurs and 117 highs.
 - 8.3.1. Primary focus during the F2F this week was the resolution of a single non-concur regarding the definition of availability and continuity in DO-377.
 - 8.3.2. The commentators agreed to downgrade the comment to a high. This comment and the two other associated high comments were resolved by agreeing to develop a White Paper.
 - 8.3.2.1. This White Paper would describe methods that can be used by UAS OEMs, UAS operators, and C2CSPs when deriving C2 Link System Quality of Service requirements.
 - 8.3.2.2. The goal is to complete the White Paper by April 2025.
 - 8.3.3. 100 FRAC comments still in progress, all editorial related to the table of contents.
 - 8.3.4. **Amelia M called for a motion to exit FRAC on DO-377B. Marv H moved that DO-377B exits FRAC, Matthew Moser seconded. No objections, motion approved.**
 - 8.3.5. **Amelia M called for a motion to request the PMC to add the WG-2 White Paper to the SC-228 TOR. Marv H moves a request should be made to the PMC requesting that the WG-2 White Paper be added to the SC-228 TOR, Tim Bleakly seconds. No objections, motion approved.**
 - 8.3.5.1. Brandi T noted that RTCA is moving away from the White Paper term and will use new language in the future.
 - 8.3.6. Amelia M thanked Marv H for all of his work supporting the development of DO-377B.
 - 8.4. Amelia M provided an update on the WG-2.4 YHF MOPS and the ongoing flight tests to support the development of that document.
 - 8.5. Amelia M updated the group on the WG-2.2 C Band group and the ongoing work to ensure compatible use of the 5030-5091 MHz spectrum between Terrestrial, LEO satellites, and GEO satellites.
 - 8.6. Amelia M noted that multiple internal RACs have been completed on the Cellular MOPS that is being developed jointly with EUROCAE WG-105. The plan is to exit FRAC on the MOPS in April 2024.
 - 8.6.1. Brandon S asked if there is any testing going on with prototype cellular C2 Link systems. Amelia stated that she believes there is testing going on but she does not have any specific information.
 - 8.6.2. Jim W asked if there is any plan for a TSO based on this MOPS. Craig Bloch-Hansen noted that Transport Canada does not currently have any

plans to develop a TSO around this MOPS but they see the document as extremely valuable and plan to bring it to the international community.

9. Agenda Item #9 - WG-4 Update

9.1. Joel Wichgers presented the update for WG-4.

9.2. Joel W reminded the plenary of the working group's current work product, a MASPS on navigation for automatic taxi operations.

9.3. Joel provided an update on the MASPS development timeline.

9.3.1. OSED to be completed shortly followed by an SC-228 RAC.

9.3.2. Estimated MASPS RAC completion date is April 2025.

9.3.3. Estimated MASPS FRAC completion date is July 2025.

9.4. Joel reviewed the major topics discussed in WG-4 meetings this week.

Noteworthy items included:

9.4.1. Review of the taxi OSED. OSED RAC expected to begin prior to the next F2F.

9.4.2. Cross-track performance characterization is generally agreed upon, still developing along-track performance characterization.

9.4.3. No OSA/OPA champion has been identified yet, one potential lead for the OSA.

9.5. Joel discussed the current Automatic Taxi Navigation System (ATNS) architecture and the relationship between the WG-1 Surface Hazard Avoidance System (SHAS) MASPS and the WG-4 ATNS MASPS.

9.5.1. Ray Mei asked if the group has been assigned DO numbers for the SHAS and ATNS MASPS yet. Joel noted that the group does not have DO numbers for these documents yet, RTCA normally assigns the DO number when the document is published.

10. Agenda Item #10 – EUROCAE WG-105 Update

10.1. Item #10 was removed from the plenary agenda.

11. Agenda Item #11 – GAR Report: FAA MASPS/MOPS Usage Update

11.1. Steve Van Trees presented an update.

11.2. Steve noted that the FAA is focused addressing changes to the regulatory structure for the next phase of UAS implementation.

11.2.1. The FAA is entertaining exemptions/waiver proposals to operate UA in the interim and applicants may leverage SC-228 products.

11.2.2. GA-ASI has an active application for TSOA on TSO-C211/TSO-C212 with WCB (AIR-777).

11.2.3. uAvionix is evaluating their certification path with regards to TSO-C213a.

11.2.4. DO-377A has been evoked as a means of compliance by applicants.

11.3. Steve noted that DO-400 (Guidance Material: Standardized Lot C2 Link Procedures for Uncrewed Aircraft Systems) is under review by AJV-S.

- 11.4. Jim Williams brought to the group's attention that the comment period for 14 CFR 91.113 has been extended and there is still an opportunity to submit comments.
 - 11.5. Lee Nguyen noted that the ASTM DAA standard has been accepted by the FAA. Lee asked if the FAA has plans to produce additional rulemaking on C2 links, DAA, and ACAS. Steve noted that there is no effort to his knowledge to provide rulemaking on these topics.
12. Agenda Item #12 V2V Update
- 12.1. Item #12 was removed from the plenary agenda.
13. Agenda Item #13 – New Business
- 13.1. Meeting look ahead.
 - 13.1.1. Next F2F and plenary January 23-26, 2024 at RTCA in Washington DC
 - 13.1.2. April 2024 F2F is April 16-19th 2024.
 - 13.1.3. July F2F is July 16-19th 2024.
 - 13.1.4. October 2024 F2F is TBD.
 - 13.2. Jim W asked if there was any additional new business.
 - 13.2.1. Ravi Jain asked if there was a process to update the slide deck prior to publication. Brandon S stated that best option for editorial changes was to email Andrew V and Katie Edwards (SC-228 Secretary).
 - 13.2.2. Ravi noted that the WG-2 TOR slide calls out a 5 MHz spectrum for the UHF MOPS but the FCC has only allocated 1 MHz. Jim W stated that the MOPS is not limited to the 1 MHz spectrum. Jim W suggested that the conversation be taken offline for continued discussion.
14. Agenda Item #14 – Adjourn
- 14.1. Brandon S called for a motion to adjourn the meeting. Fabrice K moved to adjourn, Marv H seconded. Brandon S adjourned the meeting at 10:57 AM ET.

SC-228 Leadership

Jim Williams	SC-228 Co-Chair	Aura Network Systems
Brandon Suarez	SC 228 Co-Chair	Reliable Robotics
Katie Edwards	SC-228 Secretary	Boeing
Brandi Teel	SC-228 Program Director	RTCA
Don Walker	SC-228 WG1 for DAA, Co-Group Lead	A3 by Airbus
Fabrice Kunzi	SC-228 WG1 for DAA, Co-Group Lead	Boeing/Skygrid
	SC-228 WG1 for DAA, Secretary	
Steve Van Trees	SC-228 GAR, WG2 for C2, Co-Group Lead	FAA, AIR-130
Amelia Mahan	SC-228 WG2 for C2, Co-Group Lead	Amazon Prime Air
	SC-228 WG2 for C2, Secretary	
Joel Wichgers	SC-228 WG4 for Navigation, Co-Group Lead	Collins Aerospace
Matt Harris	SC-228 WG4 for Navigation, Co-Group Lead	Boeing
Andrew Videmsek	SC-228 WG4 for Navigation, Secretary	Reliable Robotics

Appendix A- List of SC-228 Plenary Participants

ATTENDEES

Company	Name
A3 by Airbus Group	Donald Walker
ACES, Inc.	Michael Neale
Adaptive Aerospace Group	Devin Jack
Air Line Pilots Association (ALPA)	Mark Reed
Allied Pilots Association, American Airlines	Andy Alfiero
Aura Network Systems	Ally Ferguson
	Jim Williams
	Virginia Stouffer
Cahon Systems Inc	Barry Jackson
Capital Sciences, LLC	Dave Stewart
Collins Aerospace	Joel Wichgers
	Mike McDowell
	Randy Jacobson
Constellation Aviation Solutions, LLC	Walter Monk
DLR-KN	Chen Zhu
DND DTAES Canada	Tam Vu
EUROCAE	Sergio Bovelli
Federal Aviation Administration (FAA)	Anthony Long
	Avi Acharya
	Christopher Swider
	Don Nellis
	Jose Fuentes
	Matt Haskin
	Mitch Narins
	Mohammed Rahman
	Pat Maggard
	Ravi Jain
	Ray Mei
	Rose Merchant-Bennett
	Ruth Hirt
	Stephen Van Trees
Federal Communications Commission (FCC)	Kambiz Rahnvardy
	Peter Trachtenberg
	Irene Khuu
General Atomics Aeronautical Systems, Inc.	J. J. Lu
	Tim Bleakley

General Dynamics Mission System Canada	Jean-Pascal Joary
Honeywell International, Inc.	Sara Bauman
Hyundai	Dongkyu Kim
INMARSAT	Kristen Mineck
Japan Radio Air Navigation Systems Association	Hiroshi Okochi
Kansas State University	Tom Haritos
Ligado Networks	Samuel Weich
MIT Lincoln Laboratory	Maria Picardi Kuffner
	Matthew Edwards
	Randal Guendel
	Samuel Wu
	Wesley Olson
NASA	Aaron Dutle
	William Bishop
	William Johnson
Northeast UAS Airspace Integration Research Alliance (NUAIR)	Andy Thurling
Northrop Grumman Corporation	Heather Harris
NUAIR	Lee Nguyen
Reliable Robotics	Andrew Videmsek
	Brandon Suarez
RTCA, Inc.	Brandi Teel
Sagetech Corporation	Regdy Caicedo
	Rudy Johnson
	Stacey Rowlan
Supernal	Jaehyun Lee
Technology Providers, Inc.	Marvin Hammond
The Boeing Company	Fabrice Kunzi
	Matt Harris
	Matthew Moser
	Nadine Akari
	Hilary Fiorntino
Transport Canada	Craig Bloch-Hansen
	Fairy Pan
	Tom Hastie
uAvionix	Jim Davis
Xwing, Inc.	Michael Mueller