

RTCA- 228
Summary of Plenary #29 RTCA Paper No. 103-21/SC228-086
VIRTUAL
1:00 PM EST, April 15, 2021

The twenty-ninth plenary of RTCA Special Committee 228 was called to order by SC-228 Co-Chair, Brandon Suarez at 1:00PM EST on April 15, 2021 using WebEx audio and web conferencing only due to COVID-19 restrictions.

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. A revised agenda was proposed to support a presentation by EUROCAE WG105. Brandon called for a motion to revise the agenda. A motion was made by Mark Reed and seconded by Jim Williams. Motion carried.
2. Agenda Item #2- Review RTCA meeting guidelines
 - 2.1. Rebecca Morrison, AI Secen's delegate, welcomed everyone.
 - 2.2. Rebecca reviewed the Anti-Trust Policy, the Proprietary Policy and the RTCA Committee Participation Membership Policy
 - 2.3. Rebecca also briefed some meeting tips to ensure a successful virtual meeting
 - 2.4. Rebecca then briefed the online self-rostering feature. Thank you to all who self-roster!
3. Agenda Item #3- Opening Remarks/ Introductions
 - 3.1. Brandon stated there are currently 144 unique organizations and 639 registered members.
 - 3.2. Members stated their names and attendance is noted in Appendix A
4. Agenda Item #4- Approve meeting minutes from Plenary Meeting #28
 - 4.1. Christina Westover, secretary, stated she received no comments for update/revision.
 - 4.2. Christina called for a motion to approve the minutes. Fabrice Kunzi moved to approve the minutes, Mark Reed seconded.
 - 4.3. There were no objections noted, minutes approved.
5. Agenda Item #5- New Business
 - 5.1. EUROCAE WG 105 Update presented by co-chairs Alexandra Florin and Maurizio Goiak.
 - 5.1.1. MOPS for UAS communications by cellular network is chaired by Lionel Clarisse of Thales and Boris Resnick with Glonass Union.
 - 5.1.1.1. Common task with RTCA SC-228 SG2 (Jim Williams and Amelia Mahan)

- 5.1.1.2. Updated task sheet will be presented during EUROCAE TAC #86 (April, 20th) include 5G in UAS C2 cellular communication MOPS
- 5.1.1.3. UTM/U-space applications and the Network Remote Identification are out of scope
- 5.1.1.4. Task already started based on draft MOPS material (v0.15) provided by ACJA. Target date- Q2 2022
- 5.1.2. ED-265 5Ghz SAT C2 MOPS lead positions are open
 - 5.1.2.1. On April, 7th 2021 during a RTCA/EUROCAE WebEx Alexa and Maurizio shared the new WG-105 leadership for DO-362A/ED-265 compatibility issue.
 - 5.1.2.1.1. Non concur is about possible Co-Channel /Adjacent Channel interference between ground and satellite communication due to the specific technical solution (300/60 msec TDD frame) proposed by former WG105 MOPS task leader (Thales Alenia Space).
 - 5.1.2.2. The RPASP/16 WG2 IP/04 Interference Study concluded in June 2020, and performed without the participation of a Task Leader, Proposed a solution cannot be evaluated without a leader.
 - 5.1.2.3. On-going action to contact task leader to understand if Thales Alenia Space is still interested to pursue current technical solution (300/60 msec TDD frame).
- 5.1.3. U-Space related activities is led by Pascal Laurens of Airbus
 - 5.1.3.1. The EASA U-space regulatory package approved by the EASA Committee on the 24th of February
 - 5.1.3.2. The European Commission still has to formally adopt the regulation and publish it in the EUOJ
 - 5.1.3.3. The applicability date of the Regulation is 26 January 2023.
 - 5.1.3.4. EASA has set-up an expert group to develop AMC/GM with a NPA planned for December 2021
 - 5.1.3.5. EUROCAE WG105 SG3 is a member of the EASA expert group and has 5 new task sheets in close coordination with EASA, the commission, ASTM and ISO to avoid overlapping
 - 5.1.3.5.1. The 5 task sheets will be presented at EUROCAE TAC #86 (April 20th, 2021)
- 5.1.4. DAA RPAS IFR is led by B.G. Sundqvist of SAAB
 - 5.1.4.1. ED-271 MASPS DAA for IFR in airspace A to C:
 - 5.1.4.1.1. Comments answered and sent to reviewers; BG is in contact with Fabrice Kunzi. Plan to close the review and document update by end of April 2021.
 - 5.1.4.2. Technical Report identifying differences between RTCA and EUROCAE OSEDs. 13 structuring differences identified and the effect and potential reason discussed. Planned to close by May 2021.
 - 5.1.4.3. Ongoing DAA RPAD IFR Activities

- 5.1.4.3.1. MASPS for airspace classes A-G under IFR planned, based on the outputs from European Detect And Avoid System (EUDDAAS) project.
- 5.1.4.3.2. These are the major changes to ED-271.
 - 5.1.4.3.2.1. Adding RWC in all airspaces.
 - 5.1.4.3.2.2. Merge and update already available OSEDs. ED 238 - DAA A-C: does not contain RWC and ED 258 - DAA D-G remove requirement for non-cooperative IMC ability
 - 5.1.4.3.2.3. RP behavior based on RWC alerting and guidance
 - 5.1.4.3.2.4. Alerting and guidance requirements for RWC
 - 5.1.4.3.2.5. Performance requirements (OPA) for RWC incl. C2 (RLP) and sensors
 - 5.1.4.3.2.6. Update of OSA based on safety work and feedback
- 5.1.4.3.3. Sensor MOPS are under evaluation, not already in the ToR.
- 5.1.5. DAA UAS VLL is led by Julien Farjon of SARFAN
 - 5.1.5.1. Scope of the DAA VLL MOPS in work
 - 5.1.5.2. Focus on use cases
 - 5.1.5.2.1. Use case #1: BVLOS operations (e.g. linear inspections) under the specific category of operations in VLL, uncontrolled airspace (class G airspace) over rural areas, with the minimum 4 mandatory U-Space services as per final U-Space regulation. The corresponding initial air risk class is ARC-b
 - 5.1.5.2.2. Use case #2: same as Use Case #1 but in urban areas and with two addition U-Space services (weather information service and conformance monitoring). The corresponding initial air risk class is ARC-c.
- 5.2. Brandon opened the floor for questions.
 - 5.2.1. Neal Suchy asked if a formal DAA MOPS would be developed in addition to the planned MAPS. Maurizio stated their intention.
 - 5.2.2. Don Walker asked if we (RTCA/EUORCAE) will harmonize phase 3 DAA. Maurizio stated US and European differences require a discussion amongst the leadership committees. However, he believes differences will require two (US/EU) OSEDs while minimizing differences.
 - 5.2.3. Stu Searight asked if plan is to harmonize existing standards or start from a blank canvas for Europe standards. Maurizio stated, they plan to start from existing RTCA documents, with tailoring for European airspace, and dopt what currently exists for Europe.
 - 5.2.4. Co- chair, John Moore thanked Alex and Maurizio

6. Agenda Item #6- Ad Hoc WG Update
 - 6.1. Brandon, Ad Hoc WG co-chair presented.
 - 6.2. DO-304A Exit FRAC; Approve to PMC
 - 6.2.1. Metrics and Schedule
 - 6.2.1.1. Enter FRAC: 02/25/2021
 - 6.2.1.2. Exit FRAC: 03/29/2021
 - 6.2.1.3. Received 928 comments. 38 non-concurs have agreed to resolutions
 - 6.2.1.3.1. Marv Hammond and Don Nellis stated they agree to the resolution and await final text update.
 - 6.2.2. Key Improvements
 - 6.2.2.1. Mapping Gaps from CONOPS to Sections 2 and 3
 - 6.2.2.2. Transponders and ADS-B OUT
 - 6.2.2.2.1. UAS equipage challenges and amendments to Part 91
 - 6.2.2.2.2. 1030/1090/978 MHz spectrum issues
 - 6.2.2.3. Clarification of ACAS sXu and ACAS Xr Concepts and Standards
 - 6.2.2.3.1. New DAA Well Clear definitions, as needed
 - 6.2.2.4. m:N Control (multi-aircraft control)
 - 6.2.2.5. Don Nellis, stated he was disappointed that some of these issues were not addressed by WG authors sooner
 - 6.2.3. FRAC Outcome
 - 6.2.3.1. Key Findings- not part of SC-228 scope
 - 6.2.3.1.1. Need for study on 1030/1090/978 MHz spectrum capacity/limitations to understand density limits for UAS and UAM operations. Includes SC-186, SC-147, and SC-228
 - 6.2.3.1.2. Support SC-147 scope update to include development of MOPS for ACAS Xr
 - 6.2.3.1.3. Identified gap in flight rules to enable operations with flexibility of VFR and access of IFR
 - 6.2.3.1.4. Identified gap in lack of standards to enable m:N aircraft control concepts
 - 6.2.3.1.5. UAS Cybersecurity remains a standardization gap
 - 6.2.3.2. Implement Resolutions into DO-304A
 - 6.2.3.2.1. Incorporate all resolutions into document: April 19-30
 - 6.2.3.2.2. RTCA formatting: May 3-13
 - 6.2.3.2.3. Final version to PMC: May 14
 - 6.2.4. Stu Searight stated SC-147 plenary in June will discuss adding ACAS XR into the TOR for approval at the September PMC. Also for discussion- Spectrum issues analysis and studies and the needed resources from the FAA to find a common existing and UAS systems
 - 6.2.5. Andy Thurling made a motion to close FRAC. Marvin Hammond seconded. No dissents.
- < 5 minute break>

7. Agenda Item # 7- WG 2 Update (C2)
 - 7.1. Co-chair, Jim Williams presented
 - 7.2. DO-377A Approval to Enter FRAC
 - 7.2.1.1. Focus of WG2 since last plenary on completing the C2 Link System MASPS, DO-377A
 - 7.2.1.2. Review and Comment process completed, all comments resolved
 - 7.2.1.2.1. Marv Hammond made a motion to enter FRAC, seconded by Andy Thurling. No dissents, motion carries.
 - 7.2.2. Other WG2 Business
 - 7.2.2.1. Work begun on Cellular C2 Link Systems MOPS (formally LTE MOPS)
 - 7.2.2.1.1. Joint meetings with EUROCAE WG-105 begun and occur weekly
 - 7.2.2.1.2. Current focus of the joint effort is on establishing the scope of the document
 - 7.2.2.1.3. Exit FRAC- January 2023
 - 7.2.2.2. WG2 discussed plans for an update to DO-362A to address required updates
 - 7.2.2.2.1. IOUs for material not completed in time for A revision
 - 7.2.2.2.2. Possible new modulation methods
 - 7.2.2.2.3. Possible reintroduction of L-Band pending FAA research
 - 7.2.2.2.4. Error correction from issues discovered by initial applicants for TSO
 - 7.2.2.2.5. Exit FRAC- July 2022
8. Agenda Item # 8- WG 1 Update (DAA)
 - 8.1. Co-Chair, Don Walker presented
 - 8.2. EO/IR MOPS delivered to RTCA for June PMC Approval
 - 8.3. **HELP NEEDED:** Currently looking for Technical Editor to support WG1
 - 8.4. Two OSED activities in-work, led by Paul Campbell
 - 8.4.1. Break OSED out of DO-365 and into stand-alone document
 - 8.4.2. ACAS sXu OSED for inclusion as Appendix to ACAS sXu MOPS in SC-147
 - 8.5. GBSS MOPS Revision for En-route is pending modeling and simulation results from MIT Lincoln Labs
 - 8.5.1. Expect to begin update mid-summer
 - 8.5.2. Estimate FRAC by January/February 2022
 - 8.5.3. Ravi Jain asked if OSED is helping gain AP level or MOPS design requirements. Don replied DAA performance system metric updates are expected.
 - 8.6. Looking for volunteers to do analysis to support ADS-B validation using EO/IR sensor 2D tracks. Randal Guendel is investigating if MIT Lincoln Labs can support

- 8.7. **HELP NEEDED:** Looking for volunteers to support modeling and simulation activity for HAPS
 - 8.7.1. Need to generate an encounter set
 - 8.7.2. Potentially need to run several simulation iterations
 - 8.8. **HELP NEEDED:** Looking for volunteers to develop performance requirements for Terrain/Obstacle awareness integration with guidance requirements
 - 8.8.1. Neal Suchy, stated he would work with NASA to support
 - 8.9. Matt Moser (Boeing) volunteered to lead effort to characterize technical gaps to enable takeoff/landing in Class B
 - 8.10. Future Meeting Plans
 - 8.10.1. Virtual Face-to-Face: July 13-15
 - 8.10.2. Virtual Plenary: July 16
 - 8.10.3. Real Face-to-Face: Oct 11-13
 - 8.10.4. Real Plenary: Oct 14
 - 8.11. **ACTION ITEM:** John Moore, stated we'd discuss at next leadership call.
9. Agenda Item #9- WG 3 Update (Lost Link)
- 9.1. Randy Willis, co-chair shared WG3 planning to hold kickoff meeting in May 2021 after completion of DO-304A revision efforts. Targeting late May.
10. Agenda Item #10- WG 4 Update (Nav)
- 10.1. Joel Wichgers, co-chair, WG4 planning to hold kickoff meeting in May 2021 after completion of DO-304A revision efforts. Targeting second/third week.
 - 10.2. **ACTION ITEM:** Joel asked for volunteers to join the WG in AerOpus.
11. Agenda Item #11- Adjourn
- 11.1. Brandon called for closing questions and comments.
 - 11.2. A motion to adjourn was made by Marvin Hammond; Jim Williams seconded. Brandon thanked all and closed the meeting at 3:05 pm EST.

SC-228 Leadership

John Moore	SC-228 Co-Chair Ad Hoc Co-Chair	Collins Aerospace
Brandon Suarez	SC 228 Co-Chair Ad Hoc Co-Chair	General Atomics Aeronautical Systems, Inc
Don Walker	SC-228 WG1 for DAA, Co- Group Lead	A3 by Airbus
Fabrice Kunzi	SC-228 WG1 for DAA, Co- Group Lead	General Atomics Aeronautical Systems, Inc.
Matt Spanos	SC-228 WG1 for DAA, Secretary	Transport Canada
Steve Van Trees	SC-228 GAR, WG2 for C2, Co- Group Lead	FAA, AIR-130
Jim Williams	SC-228 WG2 for C2, Co-Group Lead	Unmanned Solutions
Jennifer Ledford	SC-228 WG2 for C2, Secretary	FAA
Al Secen Rebecca Morrison	SC-228 Program Director	RTCA
Christina Westover	SC-228 Secretary Ad Hoc Secretary	Boeing
Randy Willis	SC-228 WG3 for Lost Link, Co-Group Lead	Northrop Grumman
James Foster	SC-228 WG3 for Lost Link, Co-Group Lead	FAA
Mack Horton	SC-228 WG3 for Lost Link, Secretary	LS Technologies
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	General Atomics Aeronautical Systems, Inc.

Appendix A- List of SC-228 Plenary Participants

ATTENDEES

Company	Name
A3 by Airbus	Don Walker
ACES, Inc.	Alfonso Malaga Michael Neale
Adaptive Aerospace Group	Devin Jack
ALPA	Mark Reed
ARCON Corp	Siva Sivananthan
Aurora Innovations	
BAE Systems	Andrew Klappert
Bihle Applied Research, Inc.	Jacob Kay
The Boeing Company	Christina Westover Martin Kearney-Fischer John Vian Matt Moser Tim Murphy Chris Alvarez
Civil Aviation Authority of New Zealand	Charlie Morris
Cobham Aerospace Communications	
Collins Aerospace	Randy Jacobsen John Moore Joel Wichgers
COMAC	Mingwei Wang
Esterline CMC Electronics	Jean-Pascal Joary
Electronics and Telecommunications Research Institute (ETRI)	Hee Wook Kim
Federal Aviation Administration (FAA)	Art Hinaman Casey Ohringer Deepak Chauhan Paul Campbell Peter Georgiou Don Nellis Neal Suchy Ravi Jain Ruth Hirt Rose Merchant- Bennett Stuart Searight Tony Long Steve Van Trees Shelia Mariano
Federal Communications Commission (FCC)	Tim Maguire
Garmin LTD.	Ben Peetz
General Atomics Aeronautical Systems, Inc	Andrew Videmesk Brandon Suarez

Company	Name
	Fabrice Kunzi Naiel Askar Tim Grebe TojumiOluwa Adegbyega Xaviar Aloysius Redondo
Honeywell International, Inc.	Sara Bauman Jan Prokopec Aloke Roy
Hyundai UAM	Matt Aralis
INMARSAT	Kristen Mineck
Iridium	
Iris Automation	Akaki Kunchulia
JHW Unmanned Solutions, LLC.	Jim Williams
The John Hopkins Univerisity	Charles Leeper Benjamin Zintak
L3Harris	Kevin Diamond
Leonardo	Maurizio Goiak
MIT Lincoln Laboratory	Matthew Edwards Wes Olson Randal Guendel
Mosaic ATM, Inc	Todd Kilbourne
NASA	Donna Clements Miwa Hayashi Elliot Lewis Michael Vincent Doug Wada Jay Shively Jack Connolly
NextNav	Ashu Pande
Northeast UAS Airspace Integration Research Alliance (NUAIR)	Andrew Thurling
Northern Plains UAS Test Site	Erin Roesler
Northrup Grumman Corp	Lance King Randy Willis
Regulus Group	Bill Benner
RTCA	Al Secen Rebecca Morrison
Sagotech Corporation	David Day
Sematica Aerospace Limited	Carl Thibault Siu O'Young
Technology Providers, Inc.	Marvin Hammond
Thales Group	Adrian Solomon
Transport Canada	Craig Bloch-Hansen
Wing Aviation	Alexandra Florin
Wisk	Garv Stephenson