

RTCA- 228
Summary of Plenary #30 RTCA Paper No. 183-21/SC228-089
VIRTUAL
11:00 AM EST, July 16, 2021

The thirtieth plenary of RTCA Special Committee 228 was called to order by SC-228 Co-Chair, John Moore at 11:00AM EST on July 16, 2021 using WebEx audio and web conferencing only due to COVID-19 restrictions.

1. Agenda Item #1- Call to Order: Welcome
 - 1.1. John Moore, 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. Al Secen welcomed everyone.
 - 2.2. Al reviewed the Anti-Trust Policy, the Proprietary Policy and the RTCA Committee Participation Membership Policy
 - 2.3. Al also briefed some meeting tips to ensure a successful virtual meeting
 - 2.4. Al then briefed the online self-rostering feature. Thank you to all who self-roster!
3. Agenda Item #3- Opening Remarks/ Introductions
 - 3.1. John stated there have been two changes to the organization chart. He thanked Christina Westover for her service as secretary, and welcomed Katie Edwards to the role of secretary.
 - 3.2. The Ad-hoc working group is no longer on the organization chart because that activity is closed.
 - 3.3. Guest participants stated their names and organizations, and attendance is noted in Appendix A
4. Agenda Item #4- Approve meeting minutes from Plenary Meeting #29
 - 4.1. Katie Edwards introduced herself to the committee
 - 4.2. Katie Edwards, secretary, stated she received no comments for update/revision.
 - 4.3. Katie called for a motion to approve the minutes. Marvin Hammond moved to approve the minutes. Chad Kirk seconded.
 - 4.4. There were no objections noted, minutes approved.
5. Agenda Item #5- EUROCAE WG-105 update
 - 5.1. EUROCAE WG 105 Update presented by co-chairs Alexandra Florin and Maurizio Goiak.
 - 5.2. SG1-3 DAA VLL -Coordination with RTCA SC-147 on ACAS
 - 5.2.1. New way forward proposed: no Joint Activity with RTCA SC-147 per se but rather, as a first step, an analysis whether the ACAS sXu solution for CA

- would be implementable in Europe(deliverable: European industry position report on ACAS sXu)
- 5.2.2. TS will be updated and submitted for TAC approval by correspondence
- 5.3. SG2 –C2
- 5.3.1. ED-265 / DO-362 interference issue
- 5.3.1.1. On May, 4th a WebEx was organized with Thales / Airbus / ENAC (France) to discuss about ED-265/DO-362 Issue
- 5.3.1.2. Main outcome – Airbus/ENAC accept to continue the activity and propose the following way forward:
- 5.3.1.2.1. Put priority on finalization of the ICAO SARPS. Certain aspects in the current standard does not need to be specified in the ICAO SARPS / Manual (Airbus/ENAC believe it is feasible). Then the completion of the MOPS.
- 5.3.2. ICAO RPAS Panel WG2 Meeting: The deadline for finalization of the "ICAO Manual on RPAS C2 links" is set for March 2022
- 5.4. Brandon opened the floor for questions.
- 5.4.1. Ravi Jain asked if the geostationary satellite would change in the analysis, Michael Neale from RPAS Panel WG-2 answered the question that the geostationary satellite is assumed in the analysis. Airbus would not want to look at a different geostationary satellite because that would be a different interference analysis.
- 5.4.2. Jerry Hancock asked about the desire to be technology neutral in the SARPS, but it is unknown if there is a solution that will satisfy all the requirements. If there is a fundamental incompatibility, then we will have to include SARPS to form a legal basis for member states to utilize the SARPS.
- 5.4.3. Jerry Hancock asked a question in relation to DO-362 security requirements reference DO-377A, Looking at requirements in 377A, does the group intend to align with those? Maurizio Goiak requested the question be sent by email to answer as soon as possible.
- 5.4.4. Co- chair, John Moore thanked Alex and Maurizio, and provided background on the working relationship between WG-105 and SC-228
6. Agenda Item #6- WG-1 Update
- 6.1. Paul Campbell from the FAA UAS integration office will be presenting the update for WG-1
- 6.2. The WG met virtually this week
- 6.2.1. ACAS Xr ConOps, looking at applications for UAM/AAM
- 6.2.2. Several pages were dropped off DO-365B Appendix H, recommend that RTCA publish Errata with PMC approval at September meeting
- 6.2.3. MIT Lincoln Lab (LL) Modeling and Simulation effort underway. Looking to validate end to end system performance in all environments, in support of issuing for TSO of phase 2 DAA system.

- 6.2.4. MITRE Safety Case and Documentation effort supports DO-377A updates for terminal area, and supports FAA SRM process and waiver requests in each airspace that DAA system would be requested to fly.
- 6.2.5. LL looking to study novel antenna designs to possible use single omni-antenna for smaller aircraft. This effort includes spectrum analysis.
- 6.2.6. ADS-B Validation using active surveillance radar, and now EO/IR 2D information. ADS-B messaging should be validated, confirm it matches other messages and is comparable to what the technology can support.
 - 6.2.6.1. Stu Searight clarified that ADS-B does not have to be validated at the message level, but at the track level to make sure the target is real, present, and trajectory is understood.
- 6.2.7. Discussions
 - 6.2.7.1. Intent to start reviewing an sXu OSED in the next couple weeks, and join with -147 to merge the OSED as an Appendix to their document for FRAC in the mid-September timeframe. On schedule with that effort.
 - 6.2.7.2. OSED for Phase 3 is following that effort, will be available for review in the mid-fall time frame. Many AAM concepts to cover, higher density and higher tempo operations that may put limitations on surveillance technologies that are going to be used.
 - 6.2.7.3. Another topic is how to proceed on VFR-like operations. Digital Flight Rules effort, reaching out to NASA to understand where we stand with these Digital Flight Rules, and what can be accomplished in the near term. Trying to draft a few use cases for clarity.
 - 6.2.7.3.1. John Moore stated that the leadership is trying to raise the question of use cases to higher levels in RTCA for further consideration.
 - 6.2.7.4. High Altitude Platform System (HAPS) use cases proposed, and develop research needs description document, and look to industry to do some evaluation of the safety of this type of operation. This includes looking at non-cooperative well-clear definition, to assess if this can be done safely with equivalency to other aircraft operations. There is no official safety case yet, but there is some value to this and it start with writing the use cases. Hoping that the research will help us understand if the DAA system should be used with the existing well-clear definitions, or if a different class of system should be created. This will be investigated further.
 - 6.2.7.5. Looking to enable UAS operations in Class B airspace. LL developing model for UAS encounters in Class B airspace, around airports. Having these models is a key to other future operations.
 - 6.2.7.6. Looking at updating DO-365 to include EO/IR support. There are many paragraphs that need updates, a list of paragraphs that need to be addressed was generated.

- 6.2.7.7. Rev A of GBSS MOPS to add enroute class of performance
- 6.2.7.8. Integration of multi-threat guidance – not a lot of progress on this item to report currently.
- 6.2.8. Making progress on OSED items, but participation has been reduced on WG-1, and thus does not expect to meet the current dates in the TOR. Need attention from leadership to address funding and personnel gaps to meet requirements for completion of material in Phase 3 TOR.
 - 6.2.8.1. Brandon Suarez stated that the leadership is aware of the concern and will work with the WG to document a plan to move forward.
- 7. Agenda Item # 7- WG 2 Update (C2)
 - 7.1. Co-chair, Jim Williams presented
 - 7.2. DO-377A review complete
 - 7.2.1. All 472 comments reviewed and addressed
 - 7.2.1.1. None of the non-concur high comments required changing any of the requirements, mostly clarification and other clarity improvements. Definitions clarified, security requirements text and diagrams were adjusted for clarity based on inputs from Boeing and Honeywell.
 - 7.2.2. High Altitude Platform System acronym clarified.
 - 7.2.3. Some document clean up remains, all remaining work is editorial and will be complete in next 2 weeks. Approval-ready version will be presented to the PMC.
 - 7.2.3.1. Review and Comment process completed, all comments resolved
 - 7.2.3.2. Jim Williams called for a motion to exit FRAC, and called for a motion to forward to PMC to publish in September, Marvin Hammond moved to approve the exit of DO-377A from FRAC, and moved to send the document to PMC, Jenny Ledford seconded both motions. No dissents, motion carries.
 - 7.2.4. Other WG2 Business
 - 7.2.4.1. Work begun on Cellular C2 Link Systems MOPS (formally LTE MOPS) meeting weekly and on schedule to exit FRAC January 2023.
 - 7.2.4.2. Work has started for revision B of DO-377A
 - 7.2.4.2.1. Adding more work for UAM and AAM, welcoming NASA back to WG-2 to support this effort
 - 7.2.4.2.2. Anyone interested in participating should join sub-groups in AerOpus to support
 - 7.2.4.2.3. Exit FRAC planned for April 2023
- 8. Agenda Item # 8- WG 3 Update (Lost Link)
 - 8.1. Randy Willis, co-chair shared WG3 planning to hold first meeting in August 2021, reviewing relevant materials for discussions.
- 9. Agenda Item # 9- WG 4 Update (Lost Link)

- 9.1. Joel Wichgers, co-chair shared WG 4 update
- 9.2. Andrew Videmsek is secretary of WG 4, and working with ASTM F38 as liaison between two groups.
- 9.3. Focusing on developing initial UAS navigation guidance document
 - 9.3.1. Looking at DO-304A gaps and UAS ARC gaps
 - 9.3.2. Looking at near term operations for point to point routes from established airports for IFR-like and VFR-like operations
 - 9.3.3. Welcome additional participation if members are interested in expanding the scope of the committee, with current participation this is what's planned.
 - 9.3.4. Marvin Hammond in WG-2 mentioned the surface operations activity led by Matt Moser, and potential coordination between the two working groups to describe the gaps associated with the surface operations.
 - 9.3.5. Goal is to identify and describe the gaps, not solve them
 - 9.3.6. High level schedule: Exit FRAC in April 2022
 - 9.3.7. Bi-weekly meetings on Thursdays at 8 AM Pacific time. Next meeting 7/22, if anyone wants to join the authoring team, they are welcome.
10. Andrew Videmsek provided an update on ASTM F.38 activities:
 - 10.1. Technical Committee on UAS
 - 10.2. BLOS Strategy and Road-mapping activity identified 3 PNT essential functions
 - 10.2.1. Positioning Assurance
 - 10.2.2. Navigation
 - 10.2.3. Time Synchronization
 - 10.3. Developing a "new specification for positioning assurance, navigation, and time synchronization for UAS"
 - 10.3.1. Under 55 lbs and below 400'
 - 10.3.2. Class B/C/D/E with and without UTM
 - 10.4. SC-228 and F.38.02 are coordinating through Andrew V
 - 10.5. RTCA and ASTM need to coordinate their activities and ensure we do not duplicate any requirements for under 55 lbs and less than 400 ft commercial operations (non-Part 107).
 - 10.5.1. AI Secen takes the action to contact ASTM to begin the discussion
11. Agenda Item #10 - New Business
 - 11.1. Aura network briefing by Jim Williams
 - 11.2. Request for PMC to add document to the deliverables to SC-228
 - 11.3. No new scope, but an additional deliverable document to be requested
 - 11.4. Call for ToR update approval
 - 11.4.1. Marvin Hammond moved to approve, Alope Roy seconded.
 - 11.4.2. No objections noted, update approved.
 - 11.5. The ToR update to add UHF MOPS approved by the committee to refer to the PMC in September

- 11.6. Request to modify the ToR to adjust the date of DO-362B changed to July 2023 to afford the FCC time to define the rules for Air/Ground Link in the C Band.
 - 11.7. Q: Should the DO-362B be removed from the ToR rather than change the date to 2023
 - 11.7.1. It might send a bad signal that DO-362A is “done”
 - 11.7.2. PMC will likely want to see the line item to keep it in the forefront
 - 11.7.3. Better to leave the line item and move it up
 - 11.7.4. Can also leverage the assistance of the PMC organization to move the FCC along
 - 11.7.5. Perhaps asterisk the date and list qualifiers to indicate the uncertainty
 - 11.8. Call for a motion to approve the change
 - 11.8.1. Jim Williams moved to approve, Marvin Hammond seconded
 - 11.8.2. No objections noted.
 - 11.9. Discussion of next meeting dates
 - 11.9.1. October 11-13 with Plenary on the 14th
 - 11.9.2. October 11 is a federal holiday, however.
 - 11.9.3. Does not appear to be a problem having a shortened WG meetings (Tuesday and Wednesday)
 - 11.9.4. So next F2F meeting will be October 12-13 with Plenary on the 14th
12. Agenda Item #11 – Adjourn
- 12.1. No other business
 - 12.2. Adjourned the meeting at 1:22 PM ET

SC-228 Leadership

John Moore	SC-228 Co-Chair	Collins Aerospace
Brandon Suarez	SC 228 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
Katie Edwards	SC-228 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
Accord Software & Systems, Inc.	Rakesh Nayak
ACES, Inc.	Michael Neale
Adaptive Aerospace Group	Devin Jack
Advantage Consulting Engineering Services (ACES), Inc.	Al Malaga
Air Line Pilots Association (ALPA)	Andrew Sousa
Amazon Prime Air	Amelia Mahan
ARCON Corporation	Siva Sivananthan
Aura Network Systems	Ally Ferguson
Aurora Innovations	Jonathan Saunders
AviaGlobal Group	Hal Adams
BAE Systems, Inc.	Andrew Klappert
Bihrl Applied Research, Inc.	Jacob Kay
Cobham Aerospace Communications	Jeffrey Knickelbein
Collins Aerospace	Joel Wichgers
	John Moore
	Randy Jacobson
	Tyler Barney
COMAC America	Mingwei Wang
Constellation Aviation Solutions, LLC	Salim Janjua
	Walter Monk
Esterline CMC Electronics	Jean-Pascal JOARY
Federal Aviation Administration (FAA)	Alex Fu
	Anthony Long
	Arthur Hinaman
	Casey Ohringer
	Christopher Swider
	David Chen
	Don Nellis
	Ferne Friedman-Berg
	Jennifer Ledford
	John Fisher
	Keith Carver
	Kerry Bowers
	Mack Horton
Matt Harmon	

	Matt Haskin
	Mohammed Rahman
	Pamela Gomez
	Paul Campbell
	Ravi Jain
	Ray Mei
	Stephen Van Trees
	Stuart Searight
	Tiffany McCoy
Garmin Ltd.	Ben Peetz
General Atomics Aeronautical Systems, Inc.	Andrew Videmsek
	Brandon Suarez
	Tim Grebe
	TojumiOluwa Adegboyega
	Xavier Redondo
Honeywell International, Inc.	Aloke Roy
	David Counts
	Sara Bauman
INMARSAT	Jerry Hancock
	Kristen Mineck
Iridium Satellite LLC	Joseph Darden
Iris Automation Inc	Akaki Kunchulia
Japan Radio Air Navigation Systems Association	Hiroshi Okochi
JHW Unmanned Solutions LLC	Jim Williams
Joby Aviation	Zouhair Mahboubi
L3Harris	Kevin Dimond
Leonardo Electronics	Maurizio Goiak
Ligado Networks	Sachin Chhibber
Millennium Engineering & Integration Co.	John P Connolly
MIT Lincoln Laboratory	Ian Jessen
	Matthew Edwards
	Wesley Olson
Modern Technology Solutions, Inc.	Heather Harris
Mosaic ATM, Inc.	Todd Kilbourne
NASA	Aaron Dutle
	Clint St. John
	Donna Clements
	Evan Dill
	Husni Idris

	Kurt Swieringa
	Michael Vincent
	Sagar Kc
	Steve Young
	Wilfredo Torres-pomales
	William Johnson
NextNav	Ashu Pande
	Cristina Seibert
Noblis Inc.	Andy Lacher
Northeast UAS Airspace Integration Research Alliance (NUAIR)	Andy Thurling
	Scott Brenton
Northern Plains UAS Test Site (NPUASTS)	Erin Roesler
	Jim Cieplak-Vantis
Northrop Grumman Corporation	Lance King
	Randy Willis
Regulus Group	Bob Pomrink
Reliable Robotics	Chad Kirk
RTCA, Inc.	Al Secen
SAIC	Kolie Lombard
TCCA	Kajetan Litwin
Technology Providers, Inc.	Marvin Hammond
The Boeing Company	Brittany Thomas
	Dan Ellis
	Jay Greenberg
	Jefferson Hasson
	John Vian
	Katie Edwards
	Matt Harris
	Michael Vanguardia
	Monica Alcabin
	Reece Clothier
	Sheila Conway
	Stephen Yun
	Taji Shafaat
	Timothy Murphy
The Johns Hopkins University	Benjamin Zintak
Transport Canada	Matthew Spanos
	Tom Hastie
U.S. Air Force	Anthony Militello

uAvionix	Jim Davis
UK Civil Aviation Authority	Alex Georgiades
Wing Aviation	Alexandra Florin
Xwing, Inc.	Keith Allen
Other	EAS DEPARTMENT CALL
	Ed Koch
	Geme
	Rose
	William Bishop