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RTCA Paper No. 015-21/SC230-055
1/26/2021

RTCA SC-230 Plenary #24 Meeting Minutes (Jan 12-14, 2021)

Attendance list:

January 12th - WG10	
Name	Company
Karan Hofmann	RTCA
Lee Nguyen	FAA
Jean-Baptiste Berthier	Airbus
Kenny Ren	Boeing
Mohammed Ahmed	Boeing
Dawn Gidner	Honeywell
Jan Lukáš	Honeywell
William Blake	Garmin
Jeff Finley	Collins
Mark Smith	Collins
Marius Irimia	Collins
Venkata Sishtla	Collins
Patricia Hunt	NASA
Fred Proctor	NASA
Bob Avjian	MITRE
Rockee Zhang	OU
Shigeru Machida	JAXA
Nobuki Kotake	JAXA
Matthew Lug	USAF

January 13th - WG10	
Name	Company
Karan Hofmann	RTCA
Lee Nguyen	FAA
Jean-Baptiste Berthier	Airbus
Kenny Ren	Boeing
Mohammed Ahmed	Boeing
Dawn Gidner	Honeywell
Jan Lukáš	Honeywell
William Blake	Garmin
Jeff Finley	Collins
Mark Smith	Collins
Marius Irimia	Collins
Patricia Hunt	NASA
Fred Proctor	NASA
Mark Eden	ALPA
Bob Avjian	MITRE
Rockee Zhang	OU
Yunish Shrestha	OU

January 14th - WG10	
Name	Company
Karan Hofmann	RTCA
Lee Nguyen	FAA
Jean-Baptiste Berthier	Airbus
Kenny Ren	Boeing
Mohammed Ahmed	Boeing
Dawn Gidner	Honeywell
Jan Lukáš	Honeywell
William Blake	Garmin
Jeff Finley	Collins
Mark Smith	Collins
Marius Irimia	Collins
Patricia Hunt	NASA
Fred Proctor	NASA
Mark Eden	ALPA
Bob Avjian	MITRE
Rockee Zhang	OU
Vinicius Veras	Embraer
Timothy Bonin	MIT Lincoln Lab



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1/12/2021 (8:00-12:00 PST) WG-10 discussions

Administrative and agenda review:

Welcome/Administrative Remarks – RTCA Opening remarks on Anti-Trust Laws, IP Policy, and Membership Policy provided by Karan Hofmann. Jeff led introductions.

Introductions/Agenda/Minutes Approval - Minutes from October 2020 (Meeting #23) were approved without comment

Jeff review agenda and schedule:

- NASA presentation of the Swerling PDFs and analysis of the buffer area to be considered for the truth model.
- Radar manufacturer's and researcher's feedback on the test case data sent by NASA.
- Wording of the performance requirements and associated test procedures. Can Swerling be a compliance means to meet the performance requirements.
- Wording and and location for the display requirements.
- Line by line review of the whole document. Dawn took the action to upload it beginning of Jan for review.
- Discuss the planning towards FRAC and confirm that we will meet the deadline.
- Discuss potential interferences between the weather radar and 5G (not specifically related to the ice crystal topic) and if we think that SC-230 should work on that topic.
- Discuss the future of SC-230 once the HAIC topic will be completed. New topics? Planned meetings? Associated travel

WG-10 schedule review:

Deliverable: Update MOPS: DO-220B due June 2021 (FRAC complete), document submit in fall PMC meeting (September 2021)

Co-chairs review schedule/action item status:

All outstanding action items from October Plenary were reviewed



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Review of DO-220B Draft document

Document line by line review:

Comments and action items are also documented in the working copy.

Review statistical approach to verification

Acceptable MOC/V&V approach discussion:

Group had an extensive discussion about flight testing requirement, if Swerling algorithm is not used, is it true that a flight test will be required?

FAA initially recommended requiring the use of Swerling algorithm in MOPS, if company has a different approach, then a deviation is needed. Flight test is not required if compliance can be shown using simulation if Swerling method is used. In the appendix, it is desired to show some additional examples of some other algorithms. In the end, Group reached a consensus that the Swerling algorithm is a way to implement the function, however not a MOC, hence the Swerling algorithm should not be a requirement nor MOC.

Regardless of which algorithm is used, as a part of the TSO application, the simulation and analysis results will need to be submitted as a part of the MOC. Though the flight testing requirement is still open topic for discussion at the time of plenary meeting.

Airbus had concern for the need of additional flight test data if a non-Swerling algorithm is used.

Weather Radar OEMs emphasized the work that went in to develop the HIAC test cases, the effort is intended for the applications to have a model that they can trust for validation without a flight test since the flight test for HAIC is especially difficult. For a particular applicant, if the applicant already has existing flight test data (relationship between radar data and probe data), it will be good to have applicant include the flight test data in the TSO application package as a MOC. Otherwise the applicant can use simulation models and report as a MOC. Ultimately FAA will have to decide whether or not the applicant's analysis is acceptable. The exact approach to flight testing is still an open topic for discussion at the time of plenary.

Group then proceeded to discuss Appendix D:

[Action Jeff/JB]: propose a paragraph to discuss the purpose of the statistical verification technique for section D.1. (Completed during plenary meeting)



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1/13/2021 (8:00-12:00 PST) WG-10 discussions

Continue review of DO-220B draft

Review performance specification/requirement

Continue with line by line review of DO220B draft (section 2), the working document contains most of the comments and action items.

Group had a discussion on the placement of non-interference (2.1.13) and agreed 2.1.13 is an appropriate location for this section.

[Action group] revisit section 2 to verify the use of “shall”s

[Action Boeing] write/verify a draft test procedure for display non-interference 2.4.3.1.3.9

On section 2.2.1.3.9, the group had a discussion on how to word the display non-interference requirement taking into account of priority scheme, the group agreed upon the paragraph that’s in the draft document.

Group discussed section 2.2.6.4 regarding aligning with performance index described in appendix E with the requirements.

Group to reconvene on section 2.2.6.4.



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Continue review of DO-220B draft

Group continued where we left off from previous day to continue reviewing section 2.2.6.3.

Section 2.2.6.5: Group had extensive discussions on 2.2.6.5. The idea of resolution and averaging was discussed. Section D2 simulated performance provides a “resolution” parameter for uncertainty.

[Action NASA/OEM] come up with a reasonable spatial/range resolution value in section D2. NASA will provide the PDF plot of alerting thresholds.

[Action OEMs] to hold a meeting to discuss V&V and flight testing. And propose wording for section 2.4.4.4 Ice Crystal Awareness flight testing.

2.2.6.9 William had comments on the intent of the false alarm requirement, especially on the ability to avoid nuisance for the moderate concentration. Group also agreed that the false alarm requirement section 2.2.6.9 is redundant so it is removed from the draft document.

[Action WXR OEMs] run simulation/calculation analysis on a pure beam filling target to assess the statistics to evaluate nuisance requirement’s feasibility. Using their assumed relationship between IWC and reflectivity, and/or their specific technique.

[Action William] Propose changes and description to address the needs for sections 2.2.6.8 & 2.2.6.9 assuming 3 PDFs.

When reviewing section 2.2.6.10, group agreed on the deletion of this display priority section as previously agreed on during working group session.

[Action Boeing] Review the deleted priority section 2.2.6.10 to verify that’s the intent.

Added section 2.4.3.1.3.10 “New Mode annunciation tests” section.

[Action Mark] update procedure to address entire operational range (section 2.4.3.6.4)

Group ended the review at section 2.4.3.6.4. “Range coverage test procedure”.

[Action WXR mfrs] Propose test cases to support Appendix D, what scenarios are desired. Need to define scenarios (number, characteristics, etc)

Rockee was able to generate test field from NASA TASS dataset.



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The group was not able to complete all the items planned for the plenary:

Still need:

- NASA Swerling Probability Density Function data review
- Continue line by line review of document
- 5G
- Future of SC-230

[Action FAA] to propose future topics for SC-230 if there is any.

Administrative items:

Jeff makes remarks about need for more plenary meetings due to schedule delay. This January plenary will focus on producing a list of details items to be addressed. March plenary meeting will be focused on producing a document that's ready for FRAC review.

Group believes March Plenary is sufficient for FRAC ready, else TOR revision will be submitted to extend.

[Action JB/Steve/Jeff/Karan] set up working group meetings for 2021, meeting will start January 26th, on bi-weekly basis through March 15th.

Next Plenary: March 15, 16, 17 2021.



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Action item summary

Action Item #	Action	Person(s)	Estimated Completion Date
Day 1 WG-10 - HAIC:			
1	Propose a paragraph to discuss the purpose of the statistical verification technique for section D.1. (Completed during plenary meeting)	Jeff Jean-Baptiste	Complete
Day 2 – WG-10 – HAIC:			
1	Revisit section 2 to verify the use of “shall”s	Group	Upcoming Working meetings
2	write/verify a draft test procedure for display non-interference 2.4.3.1.3.9	Boeing	Next Plenary
Day 3 – WG-10 – HAIC:			
1	Come up with a reasonable spatial/range resolution value in section D2. NASA will provide the PDF plot of alerting thresholds.	Boeing, Airbus, NASA	Upcoming Working meetings
2	Meet to discuss V&V and flight testing. And propose wording for section 2.4.4.4 Ice Crystal Awareness flight testing.	Boeing, Airbus	Upcoming Working meetings
3	Run simulation/calculation analysis on a pure beam filling target to assess the statistics to evaluate nuisance requirement’s feasibility. Using their assumed relationship between IWC and reflectivity, and/or their specific technique	WXR Mfrs	Upcoming Working meetings
4	Propose changes and description to address the needs for sections 2.2.6.8 & 2.2.6.9 assuming 3 PDFs	William	Upcoming Working meetings
5	Review the deleted priority section 2.2.6.10 to verify that’s the intent.	Boeing	Upcoming Working meetings
6	update procedure to address entire operational range (section 2.4.3.6.4)	Mark Smith	Upcoming Working meetings
7	Propose test cases to support Appendix D, what scenarios are desired. Need to define scenarios (number, characteristics, etc)	WXR Mfrs	Upcoming Working meetings



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8	[ADMIN] Propose future topics for SC-230 if there is any.	FAA	Next Plenary
9	[ADMIN] set up working group meetings for 2021, meeting will start Jan26th, on bi-weekly basis through March 15 th .	Co-chairs, Karan, Jeff	Upcoming Working meetings

CERTIFIED as a true and accurate summary of the meeting.

Kenny Ren, SC-230 Secretary

Jeff Finley, SC-230 Co-chair

Dawn Gidner, SC-230 Co-chair