



Welcome to RTCA Program Management Committee Meeting

Chairman

Dr. Chris Hegarty, MITRE

December 17, 2020



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- RTCA staff will suspend any discussion that relates to such matters and the Meeting will proceed only after appropriate limitation of such discussions has been advised and agreed.

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 - 1) A bona fide, public interest basis for the reference and/or usage
 - 2) Evidence that private pecuniary interests have not driven any decision to either include or exclude a system from the market
 - 3) A commitment to license the relevant technology, patent, patent pending, or copyrighted material by completing a Commitment to License (CtL)
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- Participation in a meeting (including participation via conference telephone or via web cast or similar remote means) shall be deemed to authorize the meeting secretary to record that this proprietary policy has been communicated and accepted.



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- To participate on RTCA Committees, an individual's organization is required to be a member of RTCA. Individuals from non-member organizations may apply for membership on a committee, and if accepted, will be required to become an RTCA member.
- Individuals from Non-RTCA member organizations may attend Committee Plenary meetings that are announced on the web. Non-member attendees have the option of requesting permission to be recognized to speak during the plenary meeting. Meeting summaries and related information from previous plenary meetings will be available to the public via RTCA's website. Documents undergoing final review can be obtained by contacting RTCA. Members of the public may also submit comments on documents undergoing final review.





Introductions

Chairman Hegarty



- Rita Estrada-Cavallini – Federal Aviation Administration
- Nazeif Habboub – Collins Aerospace
- Ed Hahn – Air Line Pilots Association
- Terry Kirk – Aviation Information Sharing And
Analysis Center
- Jim McClay – Aircraft Owners and Pilots Association



- John Craig – Aviation Information Sharing And Analysis Center
- Bob Lee – Collins Aerospace





Agenda Item 2A:
Review/Approval Meeting
Summary
September 10, 2020

RTCA Paper No. 179-20/PMC-
2040





Agenda Item 2B:
Review/Approval
Administrative SC TOR
Revisions

- SC-238 – New Chairman
- SC-239 – New Secretary & Remove One Document that was Delivered





Agenda Item 3A:

- SC-147 - Collision Avoidance Systems

Stuart Searight – SC-147 Chairman

Charlie Leeper – Task Lead

December 17, 2020

RTCA Paper Nos. 275-20/PMC-2074 and
276-20/PMC-2075



Committee Make-up

- SC-147/WG-75 Leadership
 - SC-147 Co-chair: Stuart Searight, FAA/ANG
 - SC-147 Co-chair: Ruy Brandao, Honeywell International Inc.
 - WG-75 Chair: Bill Booth, EUROCONTROL
 - SC-147 Secretary: Donna Froehlich, Aurora Innovations
- ACAS Xu Leads
 - Charles Leeper, Johns Hopkins Applied Physics Lab
 - Stacey Rowlan, ACSS/L3Harris
 - Jessica Lopez, Johns Hopkins Applied Physics Lab
 - Ruy Brandao, Honeywell International Inc.
 - Brian Ulm, ACSS/L3Harris
- ACAS Xu MOPS Document Editor
 - Alan Sigman, Federal Aviation Administration/ANG
- Participants
 - Around 60-70 from multiple industry stakeholders
 - Close coordination with SC-228 WG1 (DAA) and SC-186 / SC-209 (Combined Surveillance Committee)



SC-147 Key Standards

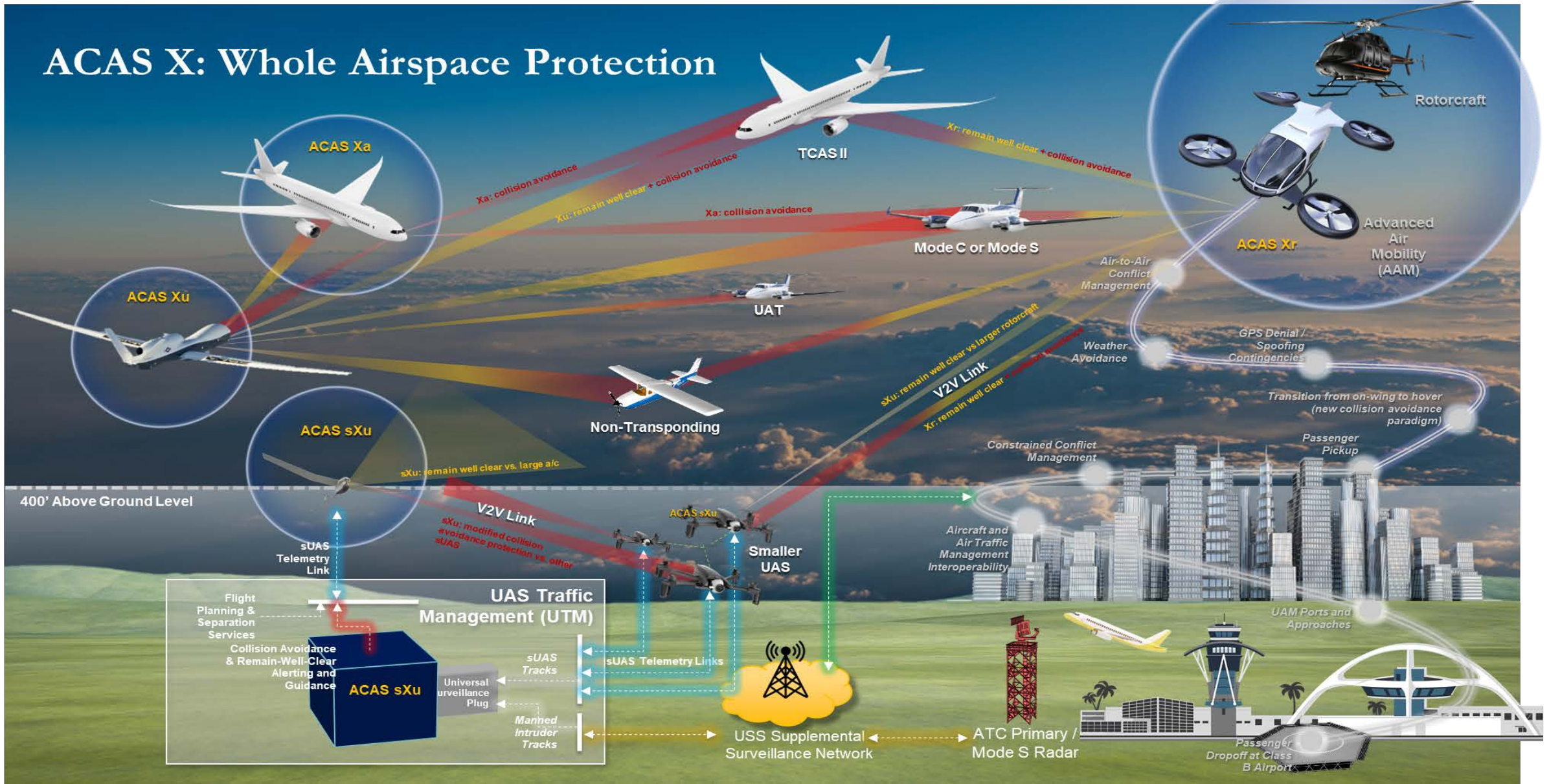
- DO-185B, MOPS for Traffic Alert and Collision Avoidance System II (TCAS II)
- DO-300A, MOPS for Traffic Alert and Collision Avoidance System II (TCAS II) Hybrid Surveillance
- DO-382, MASPS for the Interoperability of Airborne Collision Avoidance Systems
- DO-385, MOPS for Airborne Collision Avoidance System X (ACAS X) (ACAS Xa and ACAS Xo)



- MOPS for ACAS Xu: ACAS X designed for UAS
 - ACAS Xu is an implementation of a Class 3 Detect and Avoid (DAA) system per DO-365B
- MOPS for ACAS sXu: ACAS X for smaller UAS systems
- *Socializing concepts for ACAS Xr: ACAS X variant to support conventional manned rotorcraft, autonomous rotorcraft with or without passengers, and other novel aircraft such as Advanced Air Mobility (AAM)*



ACAS X: Whole Airspace Protection



SC-147 Alignment with SC-228, SC-186, SC-209

- **SC-228 Unmanned Systems**

- A DAA system is comprised of a Remain Well Clear (RWC) function and a Collision Avoidance (CA) function – requirements for these functions are found in RTCA DO-365B, *Minimum Operational Performance Standards (MOPS) for Detect and Avoid (DAA) Systems*
- DO-365B contains requirements for the display, alerting and guidance of DAA systems, but does not specify an algorithm at the prescriptive level
- ACAS Xu is a DAA solution that provides both RWC and CA functionality in compliance with RTCA DO-365B – it is specified at the prescriptive algorithm level and has undergone the rigorous verification and validation process (i.e. hazard analysis, stress testing, safety, and operational validation) associated with its predecessors, TCAS II and ACAS Xa/Xo

- **Combined Surveillance Committee (SC-186 & SC-209)**

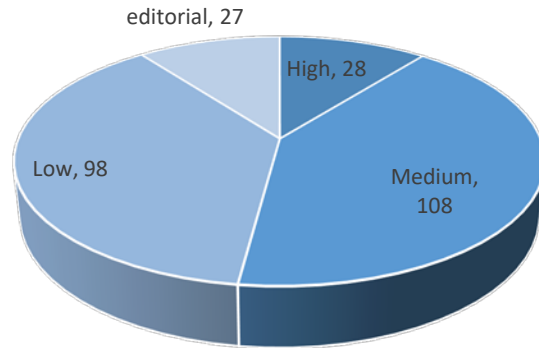
- SC-147 has worked closely with the CSC to update requirements and tests in DO-260C and DO-181F in many areas of the transponder/ACAS functionality: improved reply-rate limiting, prioritization of coordination messages on the transponder/ACAS interface, and new ADS-B message fields to provide for future CAS (as specified in DO-382, *MASPS for the Interoperability of Airborne Collision Avoidance Systems*)

Close collaboration between SC-147 and SC-228 / SC-186 / SC-209 was necessary to achieve alignment between all five standards: DO-386, DO-365B, DO-260C, DO-181F, and DO-382

Pre-FRAC Comments Summary

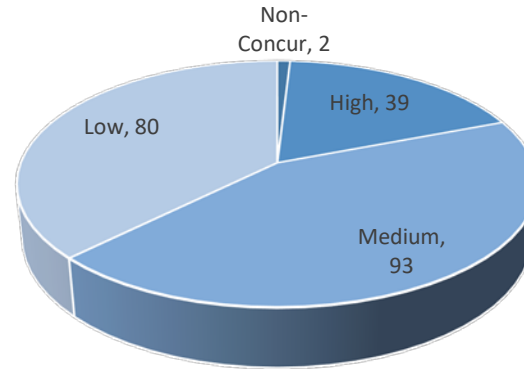
Comment period: Oct 15 – Nov 15, 2019

Vol I – Comments Assigned to Surveillance Working Group (SWG)



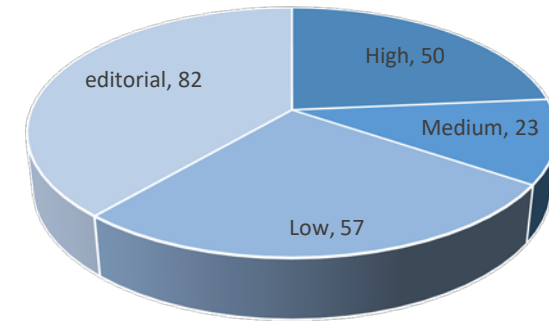
Category	# Rcvd
Non-concur	0
High	28
Medium	108
Low	98
Editorial	27
Total	261

Vol I – Comments Assigned to Threat Working Group (TWG)



Category	# Rcvd
Non-concur	2
High	39
Medium	93
Low	80
Editorial	22
Total	214

Vol II – Algorithm Design Description



Category	# Rcvd
Non-concur	0
High	50
Medium	23
Low	57
Editorial	82
Total	212

Additionally, 292 editorial comments were assigned directly to Alan Sigman, SC-147 MOPS Editor
Total: 979 Pre-FRAC Comments

Major Updates During Pre-FRAC

- Introduction
 - Maneuver Performance
 - References to SC-228 OSED
(*resolved non-concur*)
 - References to extensive verification and validation efforts by FAA TCAS Program Office
(*resolved non-concur*)
- Transponder MOPS references
 - Referencing DO-260C as minimum
 - Removing redundant requirements/tests - 2.2.3.8.3.2.8
- Monitor Section (2.2.7)
 - Ownship groundspeed and heading
 - Xu transmitter/receiver
- STM Overview Sections (2.2.5.1.X)
 - 2.2.5.1.2: Track Source Selection Tables and descriptions
 - 2.2.5.1.4: ADS-B Validation for Alerting and Guidance
 - 2.2.5.1.5: Duplicate Address Processing
- Receive Interface Sections (2.2.5.5.X)
 - Added nominal input ranges to tables
 - Cleanup/overhaul of field descriptions in tables
 - Interface requirement changes where appropriate
- Combined STM/TRM Output Interface Sections (2.2.5.6)
- Test Section Updates (2.4)
 - New track capacity tests
 - System integration tests
 - Change 1 test updates
 - Coordination Tests
 - Test Suite Section updates
- ATAR Appendix (Appendix I)
 - Final requirements: track accuracy, track uncertainty, tracker lag
 - Finalized test procedures

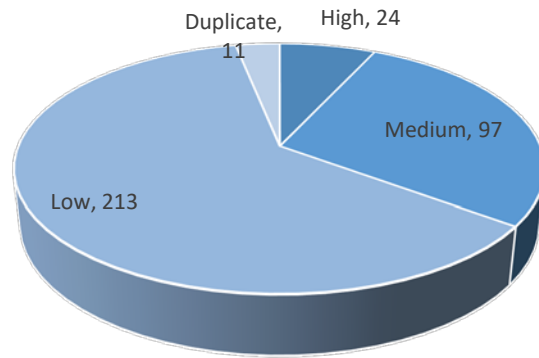
FRAC Process and Schedule

- **March 13: Commenced FRAC Process**
 - 45-day comment period
 - Followed by 4-6 weeks for SC-147 to review, organize, begin to resolve comments (can deliver comments early as well)
- **June 4: Joint SC-147/WG75 Approval per all agreements reached in principle from FRAC**
- Aug 14-28: Vol I and II distributed to SC-147 for two-week post-FRAC content verification review
- Sep 9: Virtual Plenary to ensure no issues with final comment resolutions
- Nov 17: MOPS submitted to PMC for review
- Dec 17: PMC meeting to approve MOPS

FRAC Comments Summary

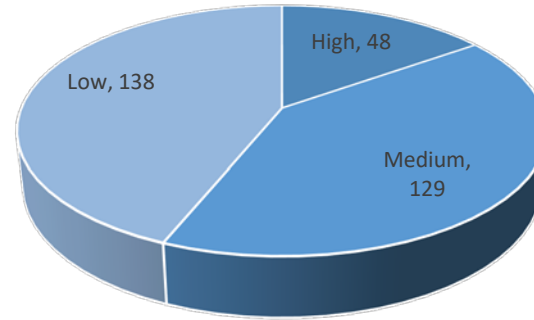
Comment period: March 13 – April 27, 2020

Vol I – Comments Assigned to Surveillance Working Group (SWG)



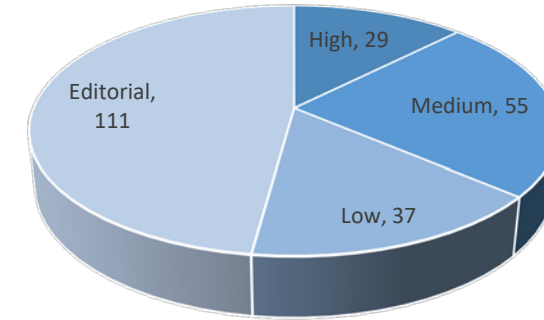
Category	# Rcvd
Non-concur	0
High	24
Medium	97
Low	213
Duplicate	11
Editorial	0
Total	345

Vol I – Comments Assigned to Threat Working Group (TWG)



Category	# Rcvd
Non-concur	0
High	48
Medium	129
Low	138
Duplicate	0
Editorial	0
Total	315

Vol II – Algorithm Design Description



Category	# Rcvd
Non-concur	0
High	29
Medium	55
Low	37
Duplicate	0
Editorial	111
Total	232

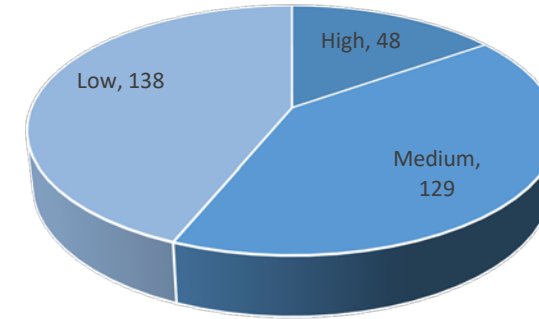
Additionally, 595 editorial comments were assigned directly to Alan Sigman, SC-147 MOPS Editor

Total: 1487 FRAC Comments

Overview of Vol I TWG Comments

❖ Main categories – High comments

- Introduction
- RF Transmissions for Monitoring (ARA Fields)
- RA Tables
- Coordination Tests
- Interface
- How to use display outputs
- Terminology relative to SC-228 (e.g. Corrective Alert)
- Operational Environment
- Interoperability MASPS consistency
- Aircraft maneuver performance
- Monitor
- System Integration Tests
- Automatic Performance Monitor
- Test Suite
- TRM Overview
- Provisions for Potential Modification

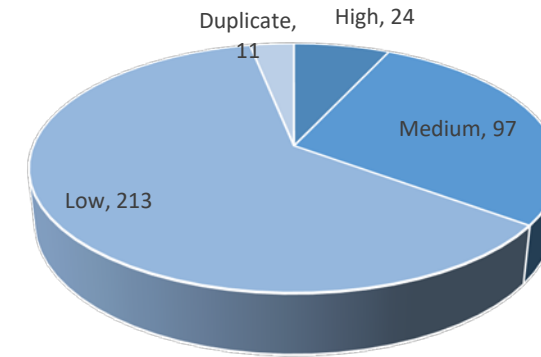


Category	# Rcvd
Non-concur	0
High	48
Medium	129
Low	138
Duplicate	0
Editorial	0
Total	315

Overview of Vol I SWG Comments

❖ Main categories – High comments

- ATAR – high-level requirement for DO-366A, finalization of Appendix
- Air/Ground Determination
- Correlation
- Degraded Surveillance
- Mode S Squitters
- Ownship Monitoring
- STM Track Source Selection Tables
- Transponder – Implementation-specific language



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- **Dec 17: PMC meeting to approve MOPS**

Conclusion

- SSC-147 recommends PMC to approve the ACAS Xu MOPS (DO-386) for release to RTCA for publication

SC-147 Upcoming Work

- MOPS for ACAS sXu: ACAS X for smaller UAS systems
 - Scheduled for June 2022 SC-147 approval
- *Socializing concepts for ACAS Xr: ACAS X variant to support rotorcraft and VLOS systems (eg Advanced Air Mobility)*

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Agenda Item 3B:

- SC-159 WG2C presentation of new document DO-384 for approval and publication

Mats Brenner

Senior Engineering Fellow and WG2C Task Lead

December 17, 2020

RTCA Paper No. 301-20/PMC-2077



Document DO-384 Title and Purpose

- Title: Minimum Operational Performance Standards (MOPS) for GNSS Aided Inertial Systems
- The purpose of this document is to provide minimum operational performance standards (MOPS) for Global Navigation Satellite System (GNSS) aided inertial systems including GNSS-aided attitude heading reference systems
- Appendix R in RTCA DO-229 (any revision) and RTCA DO-316 only covered inertial reference systems qualified per 14 CFR Part 121 Appendix G (intended for long-range operations) using a tightly-coupled integration



DO-384 Title and Purpose continued

- DO-384 provides performance standards for an expanded range of inertial sensor technologies and integrations from low grade inertials, loosely coupled to high grade inertials, tightly-coupled covering a wider range of operations
- Additionally, this document includes GNSS-aided performance standards for attitude, heading and velocity information which is not covered by RTCA DO-334 or DO-316 appendix R.



- Working group 2C roster includes 83 members
- Most members were not active participants in MOPS development or FRAC
- WG2C task lead (Chairman) is Mats Brenner from Honeywell
- Co-chairman Kevin Bridges retired in 2017
- The main contributors to DO-384 were Collins Aerospace, Airbus, Northrop Grumman LITEF, Garmin, Safran Electronics & Defense, FAA, US Air Force, JAXA, MITRE
- The FRAC process added Boeing and Thales as main contributors



WG2C Work Flow

- The work on the new MOPS (DO-384) was initiated by Kevin Bridges from the FAA and began in March of 2015
- There were two SC-159 meetings scheduled each year
- WG2C met 2.5 days at each meeting
- There were additional telecons scheduled between meetings (typically 7)
- The typical participation is 10-15 members representing 10 companies/organizations
- The working group submitted the MOPS draft for FRAC August 25 with deadline for comments on September 28
- The FRAC process was completed in time for the SC-159 meeting on October 23
- Fully updated document delivered on Nov 12

MOPS Sections Summary

- **Section 1: Purpose and Scope** provides information needed to understand the rationale for equipment characteristics and requirements stated in the remaining sections. It describes typical equipment operations and operation goals, as envisioned by the members of Special Committee SC-159, and establishes the basis for the standards stated in Section 2. Definitions and assumptions essential to proper understanding of this document are also provided in this section.

Sections Summary

- **Section 2: Equipment Performance Requirements and Test Procedures** contains the minimum performance standards for the equipment. These standards specify the required performance under standard environmental conditions. Also included are recommended bench test procedures necessary to demonstrate equipment compliance with the stated minimum requirements.
- **Section 3: Manufacturer Considerations for Installed Equipment** describes the performance required of installed equipment.

Sections Summary and Appendices Summary

- **Section 4: Aircraft Operational Performance Characteristics** lists some applicable baseline reference document
- **Section 5: Membership** lists the members of SC-159 with WG2C members marked by asterisk *
- The document has 17 appendices A to Q
 - A: Glossary and Acronyms
 - B: Inertial sensor characterization and modeling
 - C: HFOM, HPL and HEL definitions for integrated systems
 - D: Benefits and Limitations of integration
 - E: Accuracy and Integrity coasting
 - F: Integration methods
 - G: GNSS fault modes

Appendices (continued)

- H: GNSS Receiver Interface Considerations
 - I: Signal modeling
 - J: Magnetic sensing and modelling
 - K: Air data sensing and modelling
 - L: Satellite-based attitude/heading sensing and modeling
 - M: Trajectory Based Off-line Simulation Methods
 - N: Acceptable Trajectories for Testing
 - O: Gravity Modeling
 - P: CLAIM tables
 - Q: Alternate Trajectories
-
- A total of 272 pages

FRAC Results

- There were 522 comments total from Airbus, Boeing, Collins, Garmin, Thales, Honeywell, MITRE, FAA, and RTCA
- 5 non-concur (Thales 4, Collins 1) [1%]
- 41 labeled High [7.9%]
- 57 labeled Medium [11%]
- 174 labeled Low [33.3%]
- The rest were editorial [47%]

FRAC Resolution Process


- All comments delivered in a single spread sheet by the RTCA (Karan)
- A resolution column was added in spread sheet
- Telecons were added in advance of the SC-159 meeting to first address, resolve and document (in spread sheet) the non-concurs and comments labeled high
- The resolution column was updated with proposed resolutions to comments labeled medium and low and placed for review in the WG2C workspace
- For the majority of editorial and (labeled) low comments the proposed resolution was to directly accept the commenters suggestions

FRAC Resolution

- The resolution column in the spread sheet was filled in and resolutions subsequently approved for implementation in MOPS draft via telecons (including virtual SC-159 meeting)
- At the time of the SC-159 plenary all comments were resolved except 1 high, 4 medium and 3 low (FAA, IIT, MITRE) all related to the assumed fault rate of $10^{-5}/\text{h/sat}$
- These were resolved in the plenary session with one remaining action for SC-159 to form an ad-hoc group to address the hypothetical fault mode that was the main cause of the remaining concerns (activity expected to start in January)

Post FRAC Activities

- All changes defined in spread sheet were implemented in the MOPS draft (essential changes with track changes enabled)
- The extent of the changes (versus FRAC version) can be assessed by looking at the tracked changes
- 4 reviewers were selected to proofread the document and verify all resolution changes had been implemented
 - Jim Doty and Joel Wichgers (Collins Aerospace)
 - Jeff Meyer and John Barry (FAA)
- Their final edits were implemented and the document delivered to RTCA (Karan)

- 
- SC-159 recommends that the PMC approve and publish DO-384 (MOPS for GNSS aided inertial systems)

SC-159 WG2C Future Work

- When the standard for multi constellation and dual frequency GNSS has been established it is assumed DO-384 will be updated to incorporate these new signals

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Backup slides:

Non Concur Summary

Non Concur 1: Thales

- Ionospheric storm data and depletion bubble testing should not be mandatory provided the equipment is capable of maintaining integrity in the presence of such events (for instance by excluding the impacted measurements)
- Resolution: Adding monitors that detect such anomalies in a timely manner is a possible solution. Experience has shown that designing a reliable monitor for ionosphere storm fronts or depletion bubbles is not an easy task and it therefore needs to be proved by extensive testing that such a design is working. So either way these mandatory tests are needed. Also storm test already mandatory in DO-316 appendix R.
- No change resolution accepted by Thales

Non Concur 2: Thales

- Note stating: “Manufacturers should analyze their equipment for sensitivity to these (ionospheric storm) effects, and include proper design margin to cover future, larger storms”
- Resolution: Note removed

Non Concur 3: Thales

- The (availability in presence of scintillation) test is based on observations made on GPS receivers, but these observations cannot be extended to any equipment certified w.r.t. DO-229E or DO-316 (since there is no requirement addressing scintillation in those standards). Manufacturers of inertial systems cannot claim robustness against scintillation since it assumes a GNSS behavior that is not standardized.
- Resolution: Sufficient to perform test based on JAXA data. If everyone uses the same impact model results can be compared (similar use of optimal 24 GPS constellation)

Non Concur 4: Thales

- Section 2.4.9 (Robustness) lists cases or scenarios that should be addressed by proper requirements in section 2.2. In addition, the pass/fail criteria are too vague ("nothing objectionable was discovered based on engineering judgment")
- Resolution: Robustness sub section kept but restructured and reformulated based on Thales inputs

Non Concur 5: Collins

- The definitions (for ADS-B bounding in section 3) proposed have a number of serious problems that need to be addressed before this document is approved.
- Definitions reformulated

Significant changes based on FRAC process

- Most of the significant changes were in the requirements and signal modeling sub sections (first part of section 2)
- Section 2 was not perfectly clear on what was a requirement on the system under test and what was a requirement on the signal models used in the testing
- Substantial effort was added to clearly distinguish these two types of requirement
- The gravity modeling and receiver clock modeling are examples of modeling that were updated to be more clear as a consequence of this change



Agenda Item 3C:

- RTCA SC-186 DO-260C

Thomas Pagano

SC-186 WG 3 Co-Chairman

December 17, 2020

RTCA Paper No. 308-20/PMC-2079



ADS-B 1090 MHz Extended Squitter MOPS – DO-260C

- Seeking approval for ADS-B Version 3, DO-260C MOPS for 1090 MHz Extended Squitter link
- Development commenced January 2016 under the newly created Combined Surveillance Committee (CSC)
 - Since both the ADS-B and Mode S Transponder MOPS are closely coupled and many members/participants supported both MOPS development, CSC was an efficient structure with which to develop both documents
 - Since the MOPS development continued to be a coordinated activity between RTCA and EUROCAE as was the case for previous MOPS versions, CSC consisted of both RTCA committees and EUROCAE Working Groups:
 - RTCA SC-186 Working Group 3 1090 MHz ADS-B and SC-209 ATCRBS/Mode S Transponder
 - EUROCAE WG-51 SG-1 ADS-B 1090 MHz Extended Squitter MOPS and WG-49 Mode S Transponder



CSC Leadership

- RTCA SC-186 WG3
 - Tom Pagano – Regulus Group
 - Martin Gray – Trig Avionics Limited
- EUROCAE WG-51 SG-1
 - Jorg Steinleitner – Eurocontrol
- RTCA SC-209
 - Tom Pagano – Regulus Group
 - Matt Erickson – Collins Aerospace
- EUROCAE WG-49
 - Eric Potier



- ADS-B MOPS initially opened to support the ADS-B Interval Management (IM) Application (SC-186 WG4) along with known required changes from DO-260B, but many other capabilities were added along the way
 - Collision Avoidance (SC-147)
 - Meteorological Data (SC-206)
 - UAS (SC-228)
 - Commercial Space/Hypersonic and High Altitude Vehicles
 - 1030/1090 MHz RF Monitoring



MOPS Update Details

- Interval Management Application
 - Benefits from added wind and temperature data from equipped DO-260C MOPS aircraft
 - Extended range receiver to support longer range performance
 - Receiver track initiation enhancements to improve track acquisition
 - Track file maintenance enhancements to prioritize IM traffic as needed

Aviation Weather Data

- Supports applications such as IM, wake vortex avoidance and surfing, hazardous weather detection and avoidance, and aviation weather forecasting
- Requirements derived from RTCA DO-364 (Aeronautical Information/Meteorological Data Link Services), which built on previous work from RTCA, World Meteorological Organization, and ICAO Annex 3
 - Data supported includes:
 - Aircraft configuration, ICAO Aircraft Type, gross weight, wingspan
 - Icing status, wind quality, wind speed and direction, air temperature
 - Eddy Dissipation Rate (EDR), Water Vapor
 - Although broadcast of weather data is optional in MOPS, units intending to meet European EHS requirements must provide the following minimum data set: roll angle, heading, air temperature, airspeed
- DO-260C MOPS also supports broadcast of pilot-observed flight weather [Pilot Reports (PIREPs)] with 3 new on-condition messages
 - Flight Weather; Temp, Wind & Turbulence; Hazardous Weather

Support for UAS Operations

- DO-260C MOPS includes ability to broadcast a UAS/RPAS lost link condition
 - This emergency condition will be reported and may be used to initiate appropriate contingency procedures
 - When in the lost link condition, the UAS/RPAS can broadcast its contingency plan, identifying the course of action the UAS/RPAS is following
- Detect and Avoid Capability indication added so that capable collision avoidance systems (e.g. ACAS-Xa, ACAS Xu) provide RA information to such systems

Commercial Space / Hypersonic and High Altitude Vehicles

- Previous MOPS versions do not reliably support:
 - Horizontal velocities above 1000 knots
 - Altitudes above 130,000 feet
 - Vertical velocities above 32,500 feet per minute
- DO-260C MOPS has optional new Position and Velocity messages to accommodate higher velocities and altitudes
 - Horizontal and vertical velocities which would accommodate a Space Shuttle launch profile
 - Altitudes up to 1 Million feet

Introduction of Phase Overlay

- Phase Overlay (PO) technique, which provides additional data within existing messages, is specified in DO-260C MOPS
- Phase Overlay is optional in this MOPS version as all supported data for version 3 is directly supportable in the standard PPM maximum squitter rate. Current ICAO Annex 10 Volume IV SARPs maximum allowable squitter rate needs to be increased to support all allowable DO-260C MOPS messages. This increase has been initially agreed to by the ICAO Surveillance Panel but final approval pending next SARPs amendment
- PO is introduced so that industry can begin producing equipment that can readily incorporate it as this will be the method for additional 1090ES data link capacity
- PO Messages have been defined in DO-260C:
 - ADS-B State and Status Message
 - Interrogation and Reply Monitoring Messages
 - Phase Overlay Interrogation Rate Monitor Message
 - Phase Overlay Reply Rate Monitor Message

Surface Reporting Improvements

- ADS-B version 3 supports the ability to report availability of FAA's Same-Link-Rebroadcast service, thereby potentially enabling ADS B surface alerting applications on-board aircraft
- To enable more accurate position determination on the airport surface by multilateration systems, DO-260C MOPS includes transponder antenna offset information
- To improve tracking of aircraft/vehicles operating on the surface, DO-260C MOPS modifies the surface squitter transmission rate requirements

Miscellaneous Changes

- Interrogation/Reply Monitor (IRM) data, which reports transponder interrogation and reply rate activity, has been incorporated as an optional feature
 - This will improve 1030/1090 MHz spectrum monitoring and assist in the protection of aeronautical surveillance and collision avoidance system performance
- DO-260C MOPS enhances requirements for selection of airborne or surface message formats to transmit
 - Targeted for fixed-wing aircraft without an automatic means of determining on the ground status (e.g., a landing gear weight on wheels switch)
- DO-260C MOPS provides a means to initiate broadcast of 'aircraft in distress' emergency in support of Autonomous Distress Tracking to satisfy the ICAO requirement
- For all aircraft types, DO-260C MOPS provides an indication whether the aircraft is conducting manned or unmanned operations

Miscellaneous Changes (2)


- Corrected handling of aircraft identification data which can result in a potential difference between aircraft identification data received via ADS-B and ground interrogators (with these MOPS, consistent data will be presented to controllers)
- Addition of ADS-B subfields to provide various coordination capability indications to support future ACAS coordination methods
- Addition of indication when transponder is in Mode S reply-rate limiting and the ADS-B Transmit Power level
- Improved broadcast of geometric altitude both when directly reporting geometric altitude as well as when broadcasting both barometric and geometric altitude
- Improvements in reporting received geometric altitude

FRAC Summary

- A total of 1763 comments received against FRAC version of DO-260C/ED-102B
 - 23 Non-Concur Comments
 - 148 High Level Comments
 - 411 Medium Level Comments
 - 702 Low Level Comments
 - 479 Editorial Comments
- Final CSC meeting held virtually August 31 - September 4 to review and resolve outstanding FRAC comments requiring CSC discussion

Final MOPS Preparation

- After final CSC meeting, document approval was requested at September 15, 2020 SC-186 Plenary, noting that:
 - All Non-concur comments were resolved or withdrawn with written confirmation received
 - High comments were resolved
 - Actions were assigned to complete resolution to various comments not fully addressed during the meeting
 - CSC assigned a subgroup to support the editorial process to support incorporating editorial comments as well as supporting decisions in the event of conflicts in implementing comment resolutions
- SC-186 approved DO-260C with the expectation that the final MOPS could be delivered to RTCA in time for the December PMC meeting
 - Remaining work was completed with final editorial changes incorporated as well as all changes implemented to resolve comments
 - Delivered to RTCA and EUROCAE on November 11th

- 
- SC-186 Requests PMC approval of DO-260C, version 3 ADS-B for 1090 MHz Extended Squitter

RTCA



SAFER SKIES THROUGH COLLABORATION





Agenda Item 3D:

- SC-209 ATCRBS/Mode S Transponder

Presented by: Matthew Erickson, Thomas Pagano

SC-209 Co-Chairs

December 17, 2020

RTCA Paper No. 307-20/PMC-2078



- Thomas Pagano, Co-Chair
thomas.pagano@faa.gov
- Matthew Erickson, Co-Chair
matt.erickson@collins.com
- Tim Steiner, Secretary
Tim.steiner@faa.gov

- The Combined Surveillance Committee (CSC) has completed the update of the ATCRBS/Mode S Transponder MOPS
 - DO-181E to DO-181F
- The CSC is a coordination effort between four committees
 - RTCA SC-209 WG-1
 - EUROCAE WG-49
 - RTCA SC-186 WG-3
 - EUROCAE WG-51 SG-1

- DO-181F was approved by the SC-209 Plenary on September 15, 2020
- ED-73F was approved by the WG-49 Plenary on September 15, 2020
- The efforts of the CSC resulted in harmonized MOPS documents
 - RTCA DO-181F
 - EUROCAE ED-73F

- Removal of Level 1 Transponder Description
 - Supports the Restructuring of the Level 2 Transponder Description
- Restructuring of the Minimum Level 2 Transponder Description
 - Eliminates unused Mode S protocols and interfaces
 - New ICAO minimum Mode S Transponder standard for international civil air traffic
 - Clarification that Overlay Command Capability (OVC) is required for Level 2 Transponders

- Removal of Mode A/C/S All-Call (Long P4) Interrogation and Reply
 - Reduces the 1090/1030 spectrum
 - This interrogation format is no longer allowed by ICAO after January 2020
- Removal of 1090ES requirements from the Transponder MOPS and moved to DO-260C
- Removal of acquisition squitter inhibit
- Removal of Transponder control from interrogations
 - High/Low-Rate change for 1090 Extended Squitters, (RCS)
 - airborne/surface Extended Squitter Formats, (TCS)
 - Top/Bottom antenna selection, (SAS)

- Updates to Existing TCAS
 - Removal of Sensitivity Level Commands from interrogations
 - Clarification of 60/sec Mode S reply rate requirement for TCAS Equipped Transponders
 - Support for older TSO-C119a compatible Transponder is now optional
- Updates to accommodate ACAS-X
 - Additional ACAS-X capabilities
 - Resolution Advisory (RA) reporting
 - ACAS-X Capability reporting
 - RA prioritization for ACAS/Transponder Interface
 - Pass through of ACAS coordination interrogations across ACAS/Transponder interface when Transponder is unable to reply

- New transmission signal baseline for ATCRBS/Mode S Replies
 - Problem reported by European ground systems with detection of Mode S replies
 - High CW transmission signal level preceding and during an ATCRBS/Mode S reply created detection issues (Isolated Incident)
 - Requirement gap in DO-181E to limit the CW preceding and during ATCCRBS/MODE S replies
 - Defined the unwanted CW output power preceding, during and after any ATCRBS/Mode S reply
- Transponder Reply dead time reduced to increase Transponder availability
- Mode S reply rate limiting
 - Prevent long periods of greater than 100ms without Mode S replies
 - Specified a maximum allowable reply rate of 180 replies/sec

- Basic Dataflash (Optional)
 - New method of Dataflash without the need to support Comm-A and Air Initiated Comm-B Protocol
- Phase Overlay (Optional)
 - Phase Overlay modulation of Ground Initiated Comm-B (GICB) registers
 - Transmit additional data using Phase Overlay during a GICB register extraction
 - Additional data on Phase Overlay reduces the amount of GICB Mode S interrogations needed by an ANSP for surveillance
- Interrogation/Reply Monitoring (Optional)
 - ADS-B and Phase Overlay broadcast of the Interrogation and the Reply Rate observed by a Transponder
- Mode A Code retention through power cycle (Optional)

- Clarification of reply content for unsupported GICB registers
 - Reply with all ZEROs data field for any unsupported register
- Data Link Capability Register changes
- Updates to accommodate ADS-B In Interval Management (IM) applications
 - Additional Transponder registers to support GICB extraction

- SC-209 seeks PMC approval for the updated ATCRBS/Mode S Transponder MOPS as DO-181F
- Maintained FAA and EASA TSO Harmonization for DO-181F and ED-73F
- Recommend SC-209 to remain in standby for Mode-S Transponder and ADS-B Version 3 compatibility issues that may arise

RTCA



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Agenda Item 3E:

- **SC-228 DO-362A FRAC Overview**

John R. Moore, Brandon Suarez

SC-228 Co-Chairmen

December 17, 2020

RTCA Paper No. 310-20/PMC-2081

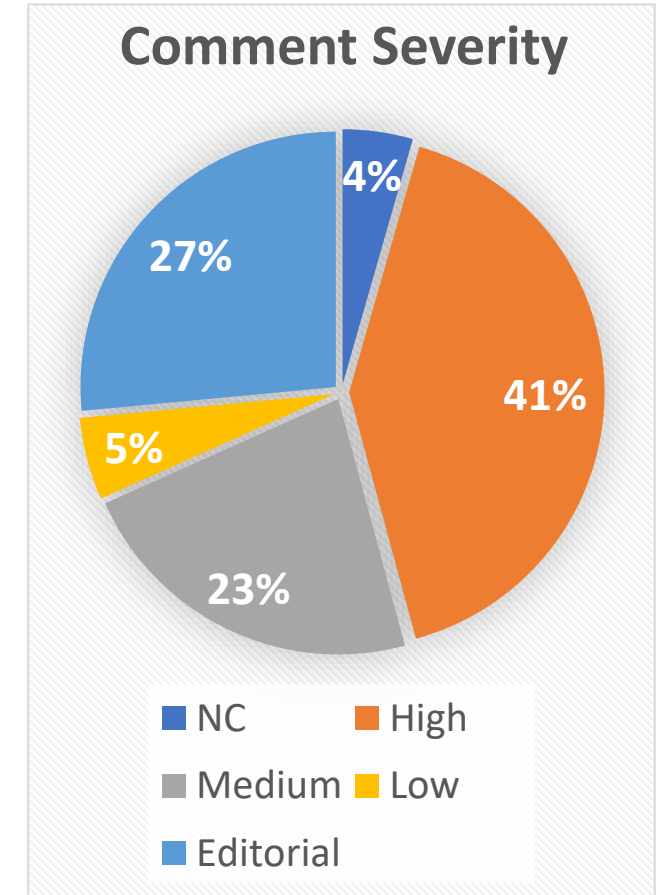


Significant Changes from DO-362

- DO-362 was a performance-based standard with a reference architecture and provisions for alternate manufacturer approaches
 - FAA TSO-C213 limitations resulted in DO-362A moving to detail specific implementations with associated testing
- Many new requirements on transmit power and siting of ground stations were needed for resolution of Near/Far problem.
- Frequency assignment and reuse criteria were added to support FCC rulemaking to enable use of C-Band
- All L-band criteria removed due to US Government policy on sharing the band
- MASPS type of content was moved to C2 Link MASPS DO-377A

Main DO-362A FRAC Takeaways

- Significant changes were required from initial version of the document as a result of FAA feedback through TSO-C213 process.
- Document accelerated, completed ahead of schedule, to take advantage of NASA Support before UAS In the NAS Program ended on 9/31/2020
- Large number of Non-Concur (29) and High (270) comments resulted from compressed time that minimized early exposure to document
 - Also, a significant amount of “non-concur inflation” was observed.
- Six test procedures were not completed against the accelerated schedule.
 - The FAA has agreed to include these in TSO instead of slow down DO-362A



All comments resolved and accepted by comment submitters

SC-228 is pleased to recommend approval of the DO-362A C2 MOPS (Terrestrial) by Program Management Committee as a formal recommendation to FAA.



Status of C2 Link System MASPS DO-377A

- Completion of DO-362A ahead of schedule required “all hands on deck” approach
- Key resources were diverted from work on DO-377A to accelerate DO-362A
- Completion of DO-377A on current TOR timeline is no longer feasible at existing level of support from WG-2 members
- Current plan requires a slip the delivery of the completed draft document by a single PMC cycle

RTCA



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Agenda Item 3F:

- SC-SC-228 DO-365B Status

John R. Moore, Brandon Suarez

SC-228 Co-Chairmen

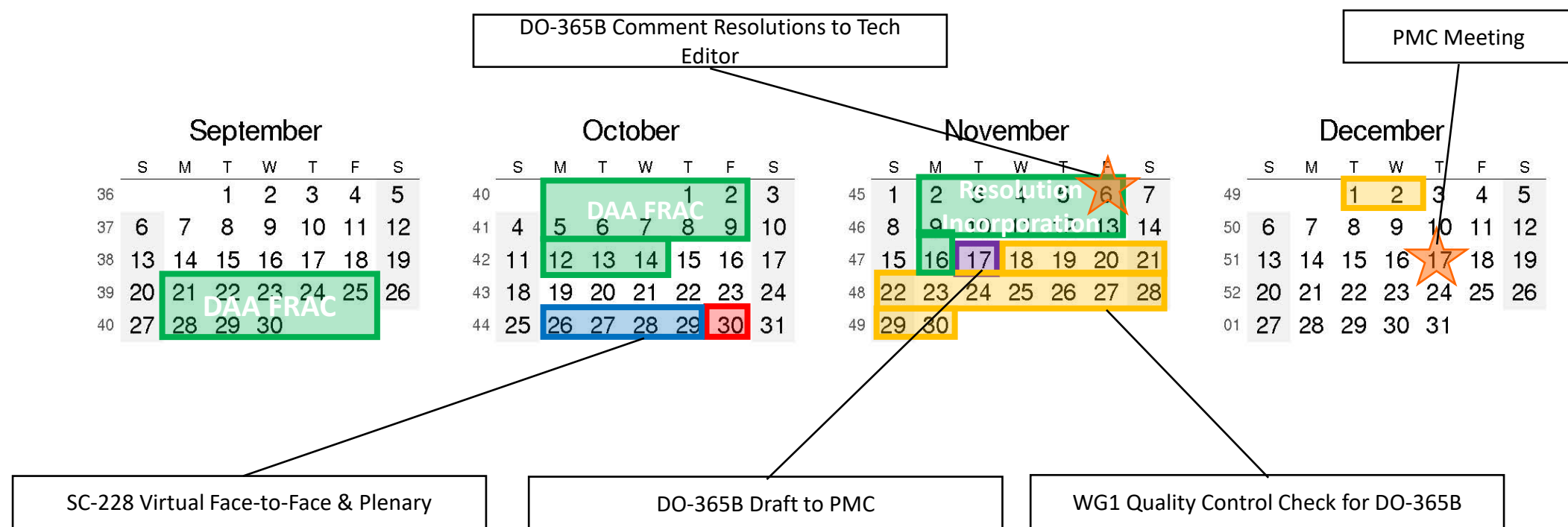
December 17, 2020

RTCA Paper No. 343-20/PMC-2095



- Include Class 3 (ACAS Xu); including both horizontal and vertical Resolution Advisories from all sensor types (for En Route use only)
- New non-cooperative well clear definition applicable to all classes
 - Expands the own ship speed envelope to 250 KIAS (ATAR Class A1)
- Updates to surveillance sensors include ATAR class designation (Class A1, A2, A3, B)

DO-365B FRAC Resolution Schedule



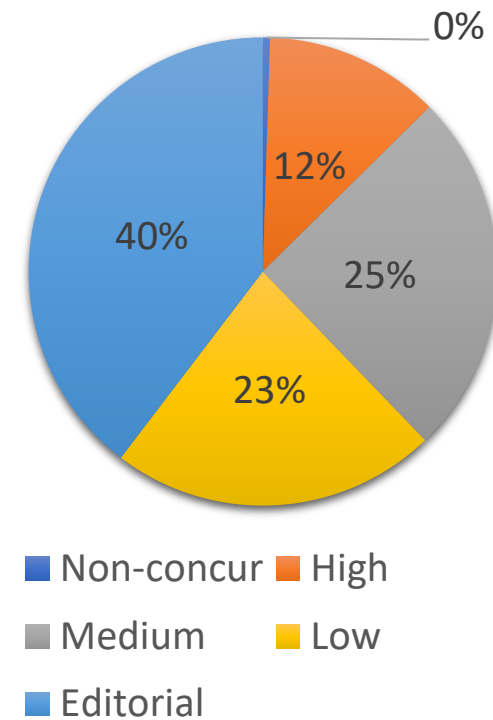
- WG1 resolved all comments with commentors during the SC-228 meeting week of Oct 26
 - All remaining text was delivered to the Tech Editor by Nov 10th, with the majority of the material delivered by Nov 6th
 - Final copy was sent to RTCA prior to Nov 17th for delivery to PMC
- However, WG quality review of final PDF revealed a considerable number of resolutions had not been incorporated properly.
 - A combination of factors impacted this problem, primarily a very compressed review schedule and a single very large, fragile Microsoft Word file.

This failure of the overall editorial process resulted in a document which was not ready to publish, and SC-228 withdrew our recommendation for approval.

DO-365B FRAC Resolution Summary

	Number/ Quantity
Non-Concur	3
High	73
Medium	152
Low	136
Editorial	239
Total	603

Comment Severity



- Working group leads are editing respective sections of DO-365B Master Copy in parallel.
 - Leads will incorporate missing resolutions and coordinate a final quality check with section authors before resubmitting to RTCA staff.
 - Will hand over to RTCA early January
 - QC of final PDF in conjunction with RTCA
 - Deliver to PMC for review late January
- Next revision of DO-365 will split out the OSED (Appendix A) into a separate document to manage the size.
 - The significant size of this document challenges Microsoft Word limits to maintain in a stable and efficient fashion.



DO-365B Changes

- Include Class 3 (ACAS Xu); including both horizontal and vertical Resolution Advisories from all sensor types (for En Route use only)
- New non-cooperative well clear definition applicable to all classes
 - Expands the own ship speed envelope to 250 KIAS (ATAR Class A1)
- Updates to surveillance sensors include ATAR class designation (Class A1, A2, A3, B)



RTCA



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Agenda Item 3G:
RTCA SC-186 – ADS-B
DO-361A Change 1
Flight-deck Interval
Management (FIM) MOPS

Jessie Turner

SC-186 Co-Chairman

December 17, 2020

RTCA Paper No. 309-20/PMC-2080



RTCA SC-186 WG-4 & EUROCAE WG-51 Sub-Group 3

ADS-B In Applications

Leadership

- RTCA SC-186 WG-4
 - Lesley Weitz – Chair
 - Greg Comstock – Secretary
- EUROCAE WG-51 SG-3
 - Bogdan Petricel – Chair
 - Nico de Gelder – Secretary

Flight-deck Interval Management (FIM) MOPS – DO-361A, Change 1

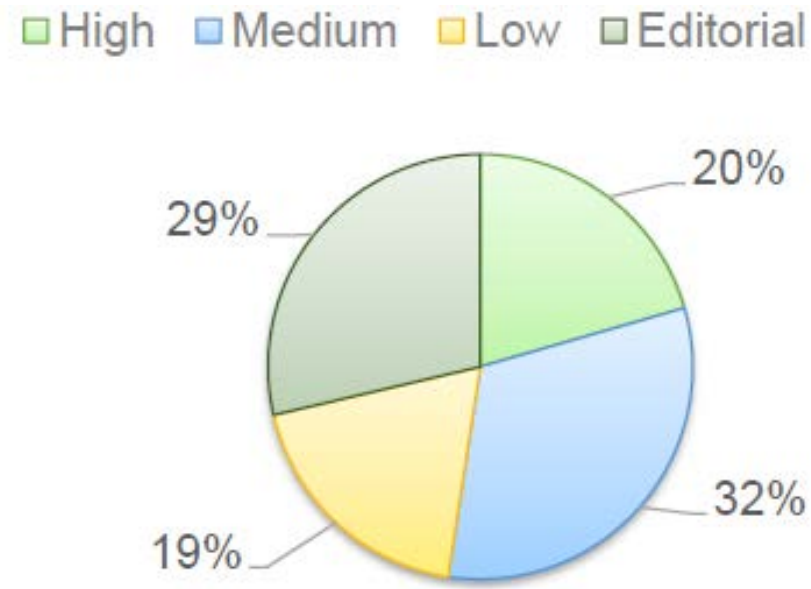
- Seeking approval for Change 1 to the Automatic Dependent Surveillance - Broadcast (ADS-B) In Application – Flight-deck Interval Management (FIM) MOPS [DO-361A]


- Addition of Test Vectors and Test Descriptions
- Removal of Surveillance Quality Metric Coasting requirements, since they have been incorporated into the updated Aircraft Surveillance Applications (ASA) MOPS [DO-317C, released June 11, 2020]
- Addition of new requirements for processing a new ADS-B Weather message that was added in the 1090MHz ADS-B MOPS (DO-260C)
- Streamline the described testing process
- Simplification of the aural alerting requirements test set-up (from closed-loop to open-loop)
- Terminology alignment across documents (FIM MOPS, ASA MOPS, ATC Transponder MOPS, and 1090MHz ADS-B MOPS)



FRAC Summary

- FRAC opened May 1, 2020
- FRAC closed July 7, 2020
- A total of 185 comments received against FRAC version of DO-361A Change 1
 - 0 Non-Concur Comments
 - 38 High-Level Comments
 - 59 Medium-Level Comments
 - 35 Low-Level Comments
 - 53 Editorial Comments



- 
- SC-186 Requests PMC approval of DO-361A, Change 1 - Flight-deck Interval Management (FIM) MOPS

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Agenda Item 4: Integration and Coordination Committee (ICC)

No Report





Agenda Item 5A:
Investigate Pulling
Requirements from Documents
and Making Available in
Separate Format

Karan Hofmann
RTCA Program Director





Agenda Item 5B: Ad Hoc to Investigate Possible sMOPS Concept

Al Secen

RTCA VP, Aviation Technology and
Standards





Agenda Item 5C: Document Configuration Management Procedure/Process

Al Secen

RTCA VP, Aviation Technology and
Standards





Agenda Item 5D: Ad Hoc for Spectrum Strategy Follow Up

Terry McVenes
RTCA President



- RTCA Report Filed with FCC October 8, 2020
- Meeting with FCC on October 16, 2020
- CTIA Filing with FCC on October 27, 2020
 - Conclusion: “The Commission should dismiss the RTCA report.”
- RTCA/AVSI Response Filing with FCC on November 19, 2020
- Industry/DOT/Congressional Efforts
- First Auction Held December 8, 2020

“This is a big day for American consumers and U.S. leadership in 5G.” FCC Chairman Ajit Pai



- Next Steps
 - MATLAB Scripts and Data Supplied to National Telecommunications and Information Administration (NTIA) for “independent analysis” of RTCA/AVSI Findings on December 14, 2020
 - Meeting with FCC on December 17, 2020 for review of mitigation recommendations from the Aviation Community
- Going Forward – RTCA Commitments
 - Model the operational environment with the best technical data available
 - Complete additional testing and analysis, and even revising the results of our report if further data become available to us
 - Work together with the telecommunications industry in a pro-active manner to find solutions that will advance the use of technology, while at the same time ensure the safety of the traveling public.





Agenda Item 5E:

- Course of Action for DO-346 Issue

Rebecca Morrison

RTCA Program Director



Resolution of Action Item 5-E

- DO-346 is technically equivalent with ED-223 and the documents were developed by SC-223 jointly with EUROCAE WG-82
- Members of both SC-223 and WG-82 also worked on the SARPS at ICAO
- SC-223 and WG-82 leadership met with SC-228 representatives on September 21st to discuss the requested changes
- SC-223 had a working meeting on October 5th and Plenary Meetings with WG-82 on November 2nd and December 2nd to review and approval TOR changes to address the concerns from SC-228
- The SC-223 Leadership is bringing the requested TOR changes to this PMC





Agenda Item 5F:

- Provide FAS Errata to PMC Members
 - Action Completed

Karan Hofmann

RTCA PMC Secretary





Agenda Item 5G:

- Conduct Electronic Ballot to Release FAS Errata
 - Original Action Completed

Rebecca Morrison

RTCA Program Director



Errata in Software Documentation
from
the Forum on Aeronautical Software

- PMC Meeting – December 17, 2020
- RTCA Paper No. 342-20/PMC-2094

- The FAS has reviewed the paper and PDF copies of all software documentation and requested RTCA and EUROCAE issue the errata
- Errata is presented to the PMC (December) and the TAC (January) prior to issuing publicly
- The Errata will be available after both groups approve

Summary of Effected Documents

DO	ED	Title	Errata
DO-178C	ED-12C	Software Considerations in Airborne Systems and Equipment Certification	Both
DO-278A	ED-109A	Software Integrity Assurance Considerations for Communication, Navigation, Surveillance and Air Traffic Management (CNS/ATM) Systems	Both
DO-248C	ED-94C	Supporting Information for DO-178C and DO-278A	Both
DO-330	ED-215	Software Tool Qualification Considerations	Both
DO-331	ED-218	Model Based Development & Verification Supplement	None
DO-332	ED-217	Object Oriented Technology and Related Techniques Supplement	None
DO-333	ED-216	Formal Methods Supplement	None



Agenda Item 5H:

- Investigate Possible Interest of supporting Virtual Centre

Doug Arbuckle

RTCA PMC FAA Representative





Agenda Item 5I:

- Provide Mr. Wright Contact info for EUROCAE
 - Action Completed

Karan Hofmann

RTCA PMC Secretary





Agenda Item 5J:

- ALPA Replacement PMC Representative
 - Action Completed

Ed Hahn

RTCA PMC ALPA Representative





Agenda Item 5K:

- FAA Replacement PMC Representative for Joe Post Position
 - Action Completed

Di Reimold

RTCA PMC GAR





Agenda Item 5L:

- Additional Areas for PMC Representation

Karan Hofmann

RTCA PMC Secretary





Agenda Item 5M:

- Outline Proposed Guidelines for TOR Revisions

Al Secen

RTCA VP, Aviation Technology and
Standards



Action Item 5-M: Outline Proposed Guidelines for TOR Revisions

- Present delay if expected more than 6 months (two PMC cycles)
- Provide reason for delay
- Request realistic goal vs. repeating of delay several time for same deliverable
- Recommend delay not be more than 15 months unless compelling reason





Agenda Item 6A:

- SC-159 Revised TOR

Dr. Chris Hegarty

SC-159 Co-Chairman

RTCA Paper No. 314-20/PMC-2084





Agenda Item 6B:

- SC-213 Revised TOR

Patrick Krohn

SC-213 Co-Chairman

RTCA Paper No. 315-20/PMC-2085





Summary of Committee Current Scope

This RTCA Special Committee will develop MASPS-level guidance which includes Synthetic Vision Systems (SVS), Enhanced Flight Vision Systems (EFVS), Enhanced Vision Systems (EVS), and Combined Vision System (CVS) technologies (which includes synthetic and enhanced vision).

Product	Description	Due Date	Changed From
MASPS DO-xxx	Minimum Aviation System Performance Standard (MASPS) for a Combined Vision System for Helicopter Operations for Low Visibility Operational Credit Joint with EUROCAE WG79	October 2020	New
MASPS DO-xxx	Minimum Aviation System Performance Standards (MASPS) for SVS/SVGS/CVS Joint with EUROCAE WG79	May 2021	May 2020
MASPS DO-xxx	Minimum Aviation System Performance Standards (MASPS) for EVS/CVS/EFVS Joint with EUROCAE WG79	May 2021	May 2020



Current Committee Leadership

Position	Name	Affiliation	Telephone	email
Chair	Tim Etherington	NASA	(757) 690-3178	timothy.j.etherington@nasa.gov
	Patrick Krohn	Universal Avionics -Elbit	(425) 602-1375	pkrohn@uasc.com
Government Authorized Representative	Trent Prange	FAA/ AIR-6B1	(202) 267-8657	Trent.Prange@faa.gov
Secretary	Thea Feyereisen	Honeywell	(763) 954-6500	thea.feyereisen@honeywell.com



Current Committee Participation

- The SC-213 is a joint committee with EUROCAE WG-79
- Meeting participation includes
 - FAA and EASA representatives
 - OEMs such as AirBus, Boeing, Dassault, Bombarier
 - Suppliers such as Collins, Universal/Elbit
 - Domestic, international, military applicants
 - Fixed wing and rotor wing airframes
- Plenary meeting typically have 30-40 attendees

Product	Description	Due Date	Changed From
MASPS DO-xxx	Minimum Aviation System Performance Standard (MASPS) for a Combined Vision System for Helicopter Operations for Low Visibility Operational Credit Joint with EUROCAE WG79	December 2021	October 2020
DO-XXX	Test Procedures for Quantified Visual Advantage Joint with EUROCAE WG79	March 2021	New

MASPS DO-xxx

- Align date with EUROCAE, which is lead on this document

DO-XXX

- In November 2020, the leadership of the committee determined that the work which had been done as part of the new EVS/EFVS MASPS to gain industry and regulatory agreement on how to test for Quantified Visual Advantage would be useful as a published stand-alone DO-XXX/ED-YYY document. The work has been developed as part of the joint work of EUROCAE WG-79 and RTCA SC-213. This content was intended to be an appendix in the joint EVS/EFVS MASPS and will be referenced in the final MASPS already in the deliverables table.
- The envisioned use of the Test Procedures for Quantified Visual Advantage is by applicants for regulatory approval.



Agenda Item 6C:

- Aeronautical Systems Security
SC-216 Revised TOR

Dave Pierce

SC-216 Chairman

RTCA Paper No. 282-20/PMC-2076



Committee Status

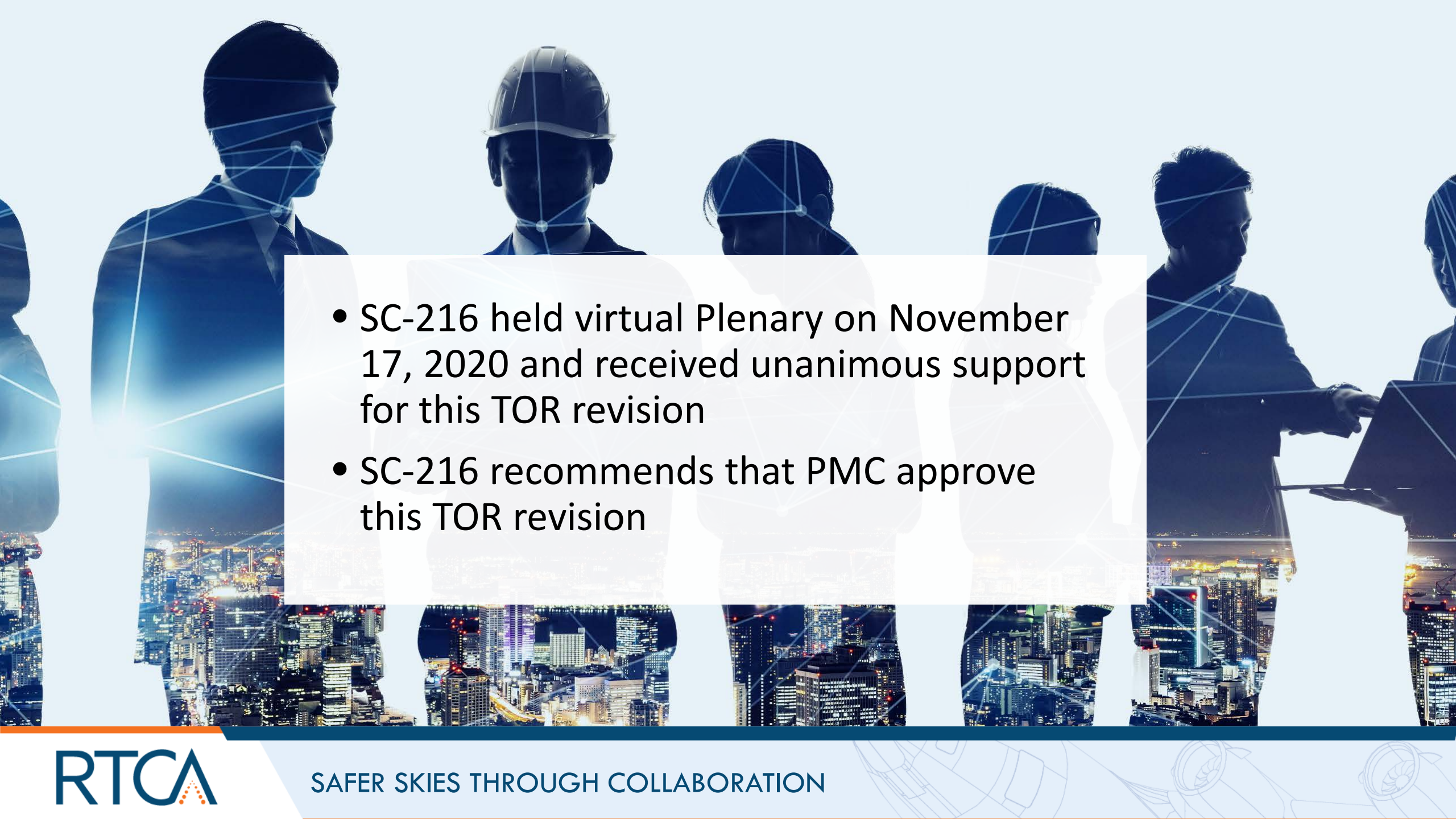
- SC-216/WG-72 Participants
 - Leadership
 - David Pierce, SC-216 Chairman
 - Sam Masri, SC-216 Secretary
 - Varun Khanna, SC-216 Govt Authorized Representative
 - Karan Hofmann, RTCA Program Director
 - Cyrille Rosay, WG-72 Chairman
 - Clive Goodchild, WG-72 Secretary
 - Anna Guégan, EUROCAE Technical Programme Manager
 - Participants
 - Around 146 participants from multiple industry stakeholders

SC-216 TOR Revision Proposal

- Multiple industry and FAA members desire to work jointly with WG-72 and jointly publish ED-205A – *Process Standard for Security Certification/Declaration of Air Traffic Management/Air Navigation Services (ATM/ANS) Ground Systems*
- FAA members providing motivation:
 - Varun Khanna, GAR for SC-216
 - Cesar Gomez, Cyber Program Specialist
- Industry Members providing motivation:
 - Boeing, Siobvan Nyikos
 - Delta Air Lines, Ted Patmore
 - United Airlines, Casey Theisen
- WG-72 also indicated desire to jointly publish
 - Cyrille Rosay, WG-72 Chair and EASA Cyber Security

- Remove DO-355A, published!
- Add joint ED-205A publication, due September 2021
- Revise due dates for ISEM, ED-201A eq and ER-013 eq due to COVID and inefficiencies caused by it
 - 6 month slip due to virtual meeting inefficiencies and desire for longer formal review period
 - WG-72 also revising their due dates to match
 - SC-216 will form a subgroup for this activity, a Task Lead and Technical Editor have been identified



- 
- SC-216 held virtual Plenary on November 17, 2020 and received unanimous support for this TOR revision
 - SC-216 recommends that PMC approve this TOR revision



Agenda Item 6D:

- Automatic Dependent Surveillance – Broadcast (ADS-B) SC-186 Revised TOR

Jessie Turner

SC-186 Co-Chairman

RTCA Paper No. 316-20/PMC-2086



SC-186 Terms of Reference - Rev 25 Change

• DELIVERABLES

- Deleted the following approved/released deliverables:
 - DO-328B – Advanced Flight-deck Interval Management (FIM) SPR/Interop
 - DO-361A & DO-361A Chg 1 - Advanced Flight-deck Interval Management (FIM) MOPS
 - DO-260C – 1090 MHz ADS-B Out MOPS
 - DO-317C – Aircraft Surveillance Applications (ASA) MOPS
- Updated Due Date for DO-282C UAT MOPS from August 2021 to March 2022
- Added boilerplate FRAC Completion Due Date *Note

• ENVISIONED USE OF DELIVERABLES

- Updated to remove content based on completed deliverables

• SPECIFIC GUIDANCE

- Revised #6 since ADS-B is used as a surveillance source for ACAS-X

***PROPOSED TOR CHANGE WAS APPROVED TO MOVE FORWARD TO THE
PMC AT THE 79th PLENARY OF SC-186/WG-51 HELD NOV. 10, 2020***



Agenda Item 6E:

- SC-236 Revised TOR

Topic Pulled





Agenda Item 6F:

- FAA Actions Taken on Previously Published Documents

FAA to Present
RTCA Paper No. 318-20/PMC-2088





Agenda Item 6G:

- Special Committee Chairmen Reports, Active Inter-Special Committee Agreements (ISRA)

Rebecca Morrison

RTCA Program Director





Agenda Item 6G:

- EUROCAE Coordination

Terry McVenes, RTCA President

Al Secen, VP Aviation Technology
and Standards

Dr. Chris Hegarty, PMC Chairman



- November 17-18, 2020
- Review of Joint and Separate Work Programs
- 2 Joint Committees will be the Default Position
- Collectively Build on our ICAO Collaboration
 - Communications
 - Coordinated Engagement on Annual/Semi-Annual Meeting
 - Observer Status on PMC/TAC





Agenda Item 7A:

- SC-135 DO-380A Discussion

Topic Pulled





Agenda Item 7B:

- SC-223 - Internet Protocol Suite (IPS) & Aeronautical Mobile Airport Communication System (AeroMACS) Revised TOR

Aloke Roy, SC-223 Chairman

RTCA Paper No. 317-2/PMC-2087





Summary of Committee Current Scope

- SC-223 is currently working on the IPS MASPS and the Profiles with EUROCAE WG-108:
 - IPS MASPS: Due, December 2020
 - Updates to IPS Profiles (DO-379) Revision A: Due, March 2021
- SC-223 completed the AeroMACS deliverables DO-345 (AeroMACS Profiles) in December 2013 and DO-346 (AeroMACS MOPS) in February 2014 as joint documents with EUROCAE WG-82



Current Committee Leadership

Position	Name	Affiliation	Telephone	email
Chair	Aloke Roy	Honeywell International	410-964-7336	Aloke.Roy@Honeywell.com
<u>Government Authorized Representative</u>	Brent Phillips	FAA/ANG-B2	202-267-2745	Brent.phillips@faa.gov
Secretary	Dongsong Zeng	MITRE	703-983-1367	dzeng@mitre.org



Current Committee Participation

- SC-223 activities are jointly held with EUROCAE:
 - The AeroMACS portion of the Plenaries are held in collaboration with WG-82
 - The IPS plenaries and working sessions are held with WG-108
- The SC-223 activities are well attended by FAA, industry members and related SDOs. Some of the participants include:
 - DSNA
 - EUROCONTROL
 - FAA
 - Airbus
 - Boeing
 - Collins
 - Honeywell
 - Thales
 - INMARSAT
 - IRIDIUM
 - Collins IMS
 - AEEC
 - ICAO
 - EUROCAE

Product	Description	Due Date	Change
Minimum Aviation System Performance Standard (MASPS) for the Internet Protocol Suite used in Aviation A-G Communication System	MASPS for the Internet Protocol Suite for avionics certification.	December, 2022	December, 2020
Aviation Profiles for Internet Protocol Suite (DO-379 Rev A)	Certification profiles for TCP / UDP / IP / DHCP / Routing / Mobility / Multilink protocols based on IETF RFCs Description	December, 2022	March, 2021
DO-346A	AeroMACS MOPS update to address the required changes to ensure compatibility with other communication systems and standards	November 2022	

- Updates to DO-346A, AeroMACS MOPS, is required to address a few defects identified by industry during system implementation. Also, this will investigate and address spurious emissions needs expressed by SC-228 Working Group 2. This is a new addition to the SC-223 TOR deliverables
- Changes to existing IPS deliverable dates are resulting from the COVID-19 impact, which significantly impacted the IPS standardization activities at ICAO, RTCA, EUROCAE and AEEC levels



Agenda Item 7C:

- SC-241/EUROCAE WG-121

Aircraft Cleaning and Disinfection Status Report

Chloe Shen Morosetti

Sr. Engineer, United Airlines and SC-241 Chairman

RTCA Paper No. 341-20/PMC-2093



- Creating a living joint Guidance Document (GD)
- Providing an internationally agreed upon set of principles for the safe and effective disinfection of aircraft
- Representing the Airline industry's best practice and known technologies
- Although responsive to the COVID-19 pandemic, the guidance can be applied to other wide-spread diseases



- 73 members representing 36 unique organizations
- Accepting non-RTCA members' participation due to the high demand
- Have had four Plenaries since August 2020
 - August 20
 - September 18
 - October 15
 - December 10
- Three sub-working groups (WG)
 - WG-1 Document Review (Led by Iva Pluhackova, IATA)
 - WG-2 Chemical Disinfectant (Led by John Taylor, ALPA)
 - WG-3 Non-Chemical Disinfectant (Led by Hal Adams, AviaGlobal Group)
- Target a 100-day publication cycle



- Document draft has been circulated and Teams are reviewing 469 comments and working on resolution

	WG-1	WG-2	WG-3
Non-Concur	5 received 4 resolved 1 withdraw	1 received 1 resolved	0
High	13 received all resolved	23 received all resolved	37 received 36 resolved 1 in progress
Medium	22 received all resolved	18 received all resolved	47 received 45 accepted 2 in progress
Low	16 received all resolved	12 received all resolved	42 received 37 accepted 5 in progress
Editorial	91 received all resolved	65 received all resolved	77 received all resolved





SC-241 Guidance Document Next Step:

- Delivery to RTCA – December 16
- Delivery to EUROCAE – December 17
- Delivery to TAC/PMC – December 17
- Approval by TAC/PMC – December 24
- Publication Noon December 24



Agenda Item 8:

- Next Meeting Documents

Karan Hofmann
RTCA PMC Secretary



- SC-206, Aeronautical Information Services (AIS) and Meteorological Data Link Services
 - DO-358B – *Minimum Operational Performance Standards (MOPS) for Flight Information Services - Broadcast (FIS-B) with Universal Access Transceiver (UAT)*
- SC-222, Aeronautic Mobile Satellite (Route) Services (AMS(R)S)
 - DO-262F – *Minimum Operational Performance Standards for Avionics Supporting Next Generation Satellite Systems (NGSS)*
 - DO-343D – *Minimum Aviation System Performance Standard for AMS(R)S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP)*

- SC-228, Minimum Performance Standards for Unmanned Aircraft Systems
 - New Document - *MOPS for Airborne EO/IR Sensor*
 - DO-365B - *Minimum Operational Performance Standards (MOPS) for Detect and Avoid (DAA) Systems*
- SC-237, Automatic Dependent Surveillance Broadcast (ADS-B)
 - New Document – *MOPS for HTAWS for Offshore Helicopter Operations*
- SC-238, Counter Unmanned Aircraft Systems
 - New Document – *OSD for Counter UAS in Controlled Airspace*

- March 18, 2021
- June 17, 2021
- September 16, 2021
- December 16, 2021?



December Action Item Review





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