Welcome to RTCA Program Management Committee Meeting

Chairman
Dr. Chris Hegarty, MITRE
March 18, 2021
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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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RTCA Committee Participation Membership Policy

• 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
Thank You and Congrats on Retirement

- Barbara Lingberg – FAA (GAR)
- Lee Nguyen – FAA (GAR)
- Brad Green – EaglePicher Technologies, LLC (SC-135 Chairman)
Agenda Item 2A:
Review/Approval Meeting
Summary
December 17, 2020

RTCA Paper No. 001-21/PMC-2107
Agenda Item 2B: Review/Approval Administrative SC TOR Revisions

- SC-214 – Chairman Company Change
- SC-231 – Leadership Company Changes
- SC-240 – GAR Change
- SC-209 – Change to Active Monitor Status
Agenda Items 3A, 3B, and 6D:
Request for PMC Approval of
DO-358B MOPS,
DO-358B Supplement,
and DO-358A Supplement Errata
Flight Information Services -
Broadcast (FIS-B) with
Universal Access Transceiver (UAT)

John Ferrara
SC-206 SG-5 Task Lead
March 18, 2021
RTCA Paper Nos. 018-21/PMC-2109,
020-21/PMC-2110, and
021-21/PMC-2111
• Committee Organization
  • Co-chairs: Mark Libant and Rocky Stone
  • GAR: Eldridge Frazier

• 3 Active Sub-Groups

• Current Terms of Reference
  • SG-1 – ISRA with SC-186
  • SG-5 – DO-358B
  • SG-6 – DO-364A
• DO-358B, Minimum Operational Performance Standards (MOPS) for Flight Information Services - Broadcast (FIS-B) with Universal Access Transceiver (UAT)

• Scope:
  • Modify DO-358A MOPS for FIS-B UAT to include:
    • Two new FIS-B products:
      • Temporary Restricted Area (TRA)
      • Temporary Military Operating Area (TMOA)
  • Correct any errors or deficiencies in DO-358A reported to SC-206 or found by SC-206 during the course of the DO-358A update and also advise SBS of any system issues found during the update
  • Review and modify DO-358A to match SBS FIS-B system changes since release of DO-358A, if necessary

• Use of Deliverable:
  • DO-358B MOPS will be used by manufacturers to ensure compatibility with the FAA’s FIS-B products delivered over UAT
DO-358B and DO-358B Supplement FRAC

• DO-358B defines the decoding of weather and NOTAM data as uplinked by the FAA on the ADS-B UAT network (FIS-B)
• DO-358B adds two new products: Temporary Restricted Area (TRA) and Temporary Military Operational Area (TMOA)
• DO-358B was approved for FRAC at the June 8, 2020 Plenary
  • FRAC period: June 15 – July 15, 2020
• FRAC Results
  • 82 comments:
    • 0 non-concur
    • 0 high
    • 11 medium
    • 42 low
    • 29 editorial
    • Some errors were found that affected the existing DO-358A Supplement (test files)
• All FRAC comments were resolved
• Garmin discovered Current Report List (CRL) issue during independent testing
  • The CRL provides a method for airborne equipment to determine if it has received all reports for designated products sent by the ground system

• Identified during FRAC Resolution timeframe

• Design of CRL for the ground system for the new TRA and TMOA was incorrect
  • The CRL for the ground system needed to be changed
SC-206 Plenary Results

• SC-206 Plenary held August 26, 2020
  • DO-358B FRAC Resolution was completed and approved
  • SC-206 Plenary decided not to release DO-358B to PMC
    • Waiting for resolution of newly discovered CRL issue
  • Plenary approved second FRAC once solution was found to the CRL issue and DO-358B document was updated

• Discussion and approval to prepare DO-358A Supplement Errata
• DO-358B with the CRL fix was released for FRAC 2
  • FRAC 2 period: November 6 – December 6, 2020
  • FRAC 2 opened the complete document for comments
    • Reviewers were encouraged to concentrate on only the CRL changes
    • No comments were received

• SC-206 December 11, 2020 Plenary Discussion
  • FRAC 2 results were briefed
  • DO-358B was approved for forwarding to the PMC
  • DO-358B Supplement was approved for forwarding to the PMC
  • DO-358A Supplement Errata was also approved for forwarding to the PMC
Recommendation for PMC Approval

• Recommend the PMC approve the following documents for RTCA publication:
  • DO-358B
  • DO-358B Supplement
  • DO-358A Supplement Errata
SC-206 Continuing Efforts

• SG-1
  • Establish requirements enabling air-to-air and air-to-ground transfer of Aircraft-based Observation meteorological parameters contained in RTCA DO-364 MASPS for Aeronautical Information / Meteorological Data Link Services within DO-282C MOPS for Universal Access Transceiver (UAT) Automatic Dependent Surveillance - Broadcast (ADS-B)

• SG-6/EUROCAE WG-76
  • Adding seven AIS/MET Services to DO-364A – Minimum Aviation System Performance Standards (MASPS) for Aeronautical Information / Meteorological Data Link Services

• SG-5
  • Going on hiatus; pending future tasking
Agenda Item 3C:

Will Not be Presented
Agenda Item 3D:

John R. Moore & Brandon Suarez
Co-Chairs, SC-228

March 18, 2021

RTCA Paper No: 046-21/PMC-2117
• 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)
• WG1 resolved all comments with commentors during the SC-228 meeting week of October 26, 2020
  • All remaining text was delivered to the Tech Editor by Nov 10\textsuperscript{th}, with the majority of the material delivered by Nov 6\textsuperscript{th}
  • Final copy was sent to RTCA prior to Nov 17\textsuperscript{th} for delivery to PMC

• WG1 quality review of the final PDF revealed a considerable number of resolutions had not been incorporated properly.
  • There was insufficient time to recover before December 2020 PMC meeting to present at that time.

• A second pass editorial process produced a corrected copy for consideration by PMC in this cycle.
## DO-365B FRAC Resolution Summary

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### Comment Severity Pie Chart

- Non-concur: 40%
- High: 12%
- Medium: 25%
- Low: 23%
• The next revision of DO-365 will split out the OSED (Appendix A) into a separate document to better manage the size.
  • The significant size of this document challenges Microsoft Word limits to maintain in a stable and efficient fashion.
Conclusion

• SC-228 recommends approving DO-365B and Supplement as submitted to PMC for publication.
SC-228 approved all FRAC comment resolutions as scheduled at 27th Plenary Meeting on 27 January 2021.

Editorial process for final formatting was interrupted with the unexpected loss of availability of the document manager.

Alternate resources have been applied to finish the last wrap up and we plan to bring this document forward at the June 2021 PMC meeting.
Agenda Item 3E:
DO-376: Minimum Operational Performance Standard for Offshore Helicopter Terrain Awareness and Warning System (HTAWS)

Mike Deer
Chair, SC-237

March 18, 2021

RTCA Paper No: 049-21/PMC-2119
• Established in May 2019 to work with EUROCAE WG-110 on a new MOPS for HTAWS addressing offshore operations

• No updates to TOR (met schedule)

• Leadership
  • RTCA Chair – Mike Deer, Bell
  • EUROCAE Chair – Yasuo Ishihara, Honeywell, Inc
  • GAR – Charisse Green, FAA
  • Secretary – Mark Prior, Prior Consulting (UK CAA)

• Participation
  • Participants included members from HTAWS/TAWS manufacturers, Heli-Offshore, EASA, TCCA, UK CAA and major helicopter OEMs
DO-376:

- Defines the Minimum Operational Performance Standards (MOPS) for an Offshore Helicopter Terrain Awareness and Warning System (Offshore HTAWS)
- Implements “classic” alerting modes similar to DO-367 TAWS
  - Based on recommendations in UK CAA CAP1519 - Offshore Helicopter Terrain Awareness Warning System Alert Envelopes
- MOPS includes Offshore HTAWS functional requirements and not specific equipment requirements
  - Functionality can be imbedded within existing aircraft systems or in dedicated equipment
FRAC/OC Comment Summary
Comment period: September 25-November 11, 2021

**DO-376 Comments**

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Note: Late comment from RTCA secretariat to add missing EUROCAE Chapter 7 (RTCA Section 4). A ballot was sent to committee to add section and approve wording.
Summary of Non-Concur (and resolution)

• One Non-Concur from EASA regarding environmental test requirements
  • MOPS was written assuming the functionality was embedded within existing systems and not in dedicated hardware

• The non-concur was discussed with the EASA author during the plenary and an agreement was reached to add proviso regarding possible dedicated hardware

• EASA confirmed acceptance of the revised text and the non-concur was closed
Conclusion

• SC-237 Recommends approving DO-376 as submitted for publication
Follow on work

• Continue work to generate a new MOPS for Onshore HTAWS to support EASA RMT.0728 – “Prevention of controlled flight into terrain with helicopters and helicopter terrain awareness and warning systems”
  • DO-309/TSO-C194 to remain unmodified for classic modes

• Proposed work includes:
  • Customization of the ED-285/DO-376 “classic modes” required to adapt them for onshore operations
  • Possible improvements to DO-309/ETSO-C194 FLTA modes
  • Other improvements proposed by WG-110/SC-237

• Draft ToRs have been prepared for discussion
Agenda Item 3F:
DO-389: Operational Services and Environment Definition for Counter-UAS in Controlled Airspace

Ryan Wallace
Chairman, SC-238
March 18, 2021
RTCA Paper No: 048-21/PMC-2118
Established in Feb 2020 to work with EUROCAE WG-115 on a new OSED, SPR and INTEROP for addressing the integration of a Counter-UAS capacity into the existing aerodrome and en-route surveillance systems.

No updates to TOR (met schedule)

Leadership
- RTCA Chair – Ryan Wallace, Embry-Riddle Aeronautical University
  - Until September 2020: Max Fenkell, AIA
- EUROCAE Chair – Jorge Munir El Malek Vázquez, Indra Sistemas
- Secretary – Philippe Robin, CS Group
  - Until December 2020: Patrick Garnier, CS Group

Participation
- More than 75 participants in RTCA SC-238 and more than 100 in EUROCAE WG-115, including FAA, ALPA, NATCA, USAF, EASA, IATA, EUROCONTROL, etc.
DO-389:

• It introduces the overall capability of a C-UAS System, including the detection capabilities of unauthorized UAS in a protected area of influence around an airport and address the resulting hazard or threat, in a risk-based balanced manner.
  • While focus is on the protection of airports, associated air traffic and surroundings, similar situations in different environments might also be considered, such as flight operation around critical infrastructure, over urban areas, major events or mass gatherings.

• Threats considered in this document are the unauthorized UAS, conducting errant operations (i.e. malfunctions, clueless or careless operators) or malicious operations (i.e., intentional, criminal operators).

• It provides a detailed description of the operational services of a C-UAS system, and the environment in which such a system will operate. It proposes operational requirements and associated assumptions that will be further detailed in the complementary standard documents: Safety and Performance Requirements (SPR) and Interoperability Requirements (INTEROP).
FRAC/OC Comment Summary
Comment period: October 1-November 16, 2021

**DO-389 Comments**

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Summary of Non-Concur (and resolution)

- Two Non-Concur from Andrew Thurling (Northeast UAS Airspace Integration Research Alliance (NUAIR) regarding:
  - Non-Concur 1: “The C-UAS system should be able to provide the necessary information to support the distinction between unauthorized and authorized drones”
  - Non-Concur 2: “Chapter 5 – Scenario description, all scenarios need to be fleshed out more”

- The non-concur comments were discussed with the author before the plenary and an agreement was reached for both comments which were presented and approved during the plenary, particularly:
  - Non-Concur 1: Add at the end of current REC:3 this “This can be accomplished using an integrated system or independent system”
  - Non-Concur 2: Chapter 5 was fully reviewed, proposing a high-level approach, classified response scenarios according to the associated level of impact of each UAS event.

- Andrew Thurling confirmed acceptance of the revised texts and both non-concur comments were closed. (Non-Concur 1 accepted January, 26, Non-Concur 2 accepted January, 21)
Conclusion

• SC-238 Recommends approving DO-389 as submitted for publication
Follow on work

• Continue work to generate the next two documents:
  • System Performance Requirements for non-cooperative UAS detection systems (SPR)
  • Interoperability Requirements for Counter-UAS systems (INTEROP)

• Current status
  • New editor is available for both documents.
  • Approach based on focus subgroups (performance, safety and interoperability) with specific co-leaders.
    • Co-leaders were chosen in 7th Plenary Meeting (Nov 2020).

• (Potentially) Update Target dates for these documents, accumulated some delay in this new stage.
Agenda Item 4:
Integration and Coordination Committee (ICC)

Item 4A: Investigate possible action for Spectrum monitoring or other activities
Agenda Item 4:
Integration and Coordination Committee (ICC)

Item 4B: ISRA Process:
Possible Review / Modification?
Agenda Item 5A:
Investigate Pulling Requirements from Documents and Making Available in Separate Format

Al Secen
RTCA VP, Aviation Technology and Standards
Agenda Item 5B: Document Configuration Management Procedure/Process

Al Secen
RTCA VP, Aviation Technology and Standards
Agenda Item 5C:
Ad Hoc for Spectrum Strategy Follow Up

Terry McVenes
RTCA President
• Meetings Since Last PMC

• Draft TOR – Potential Deliverables
  • Report on current RTCA standardized RF systems and their RF performance
  • DO-XXX – Spectrum Guidance for the development of aviation wireless systems

• Radar(Radio) Altimeter Update
  • ICAO ANC briefing – February 22, 2021
  • ICAO Frequency Spectrum Management Panel (FSMP) – Al and Andy
  • Formation of Radar Altimeters Coordination Group (GAMA, RTCA, NATA, HAI, NACA, CAA, NBAA, AOPA, A4A, EAA, AEA, ALPA, +)
  • MITRE Engenuity – Synergies with Aviation and Spectrum Sharing
  • RTCA outreach to CTIA

• Recommendation – maintain status quo and report back to PMC in June
Agenda Item 5D:
• Electronic Ballot for DO-388
  From SC-241
Action Completed
Karan Hofmann
PMC Secretary
Agenda Item 6A:
SC-227
Standards of Navigation Performance
Terms of Reference Update

Michael Cramer, Chair SC-227
Data Driven Charts – Goal Clarification

March 18, 2021
RTCA Paper No: 050-21/PMC-2120
Scope of Committee

• MASPS DO-236D & MOPS DO-283C
  • Incorporate all of DO-236C Change 1
  • Strengthen standards for DME navigation to offer more resilient RNP capability – ECD 2023
  • Update to reflect lessons learned in PBN operations
  • Work toward operational compatibility between Flight-deck Interval Management (FIM) and Time of Arrival Control (TOAC) with SC-186 – ECD 2023

• MOPS DO-257C
  • Develop the first public standards for presentation of data driven charts on electronic displays in the flight deck – ECD 2024
Scope of Changes to TOR

- Changes are confined to data driven charting standards work to better define the intent and modify the prescriptive language relative to charting implementation.
- No other changes are being proposed
Conclusion

• SC-227 Request the PMC approve this TOR change
Agenda Item 6B:
SC-235
Non-Rechargeable Lithium Batteries
Terms of Reference Revision

John Trela
SC-235 Chairman

March 18, 2021
RTCA Paper No: 056-21/PMC-2122
• DO-227A published September 21, 2017
• Several inputs received for clarification/revision to document
• SC-235 moved to Active Monitor (AM) Status March 2020
• Held five Plenary Sessions to discuss inputs
• Main Topics:
  • Relative Humidity / Temperature Test Profiles Correlated
  • Clarification and Specifics for at Least 10 Tests
  • Clarification of Mitigation of Cell Failures at Next Higher Assembly(ies)
• Came to consensus that DO-227A needed to be open for revision
Scope of Changes to TOR

• Open DO-227A for revision
• Focus on main points received and discussed during AM Plenaries
• Set Deliverable Due Date March 2022
Conclusion

• SC-235 Request the PMC approve this TOR revision
Agenda Item 6C:
SC-236
Standards for Wireless Avionics Intra-Communication System (WAIC) within 4200-4400 MHz
Revised TOR
Al Secen
RTCA VP, Aviation Technology and Standards
Agenda Item 6E:
- FAA Actions Taken on Previously Published Documents

FAA to Present
RTCA Paper No. 062-21/PMC-2124
Agenda Item 6F:
Chair Reports

Rebeca Morrison
RTCA Program Director

March 18, 2021

RTCA Paper Number: 064-21/PMC-2126
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Chair Reports will be provided for PMC Review no less than 7 days before the PMC Meeting.

We will show the matrix of reports.

PMC members can raise any questions about a report or inquire with the PD on the status of the committee.
• Questions?
Agenda Item 6G:
RTCA International Coordination (EUROCAE Coordination)

Rebecca Morrison
RTCA Program Director
March 18, 2021

Paper Number: 063-21/PMC-2125
EUROCAE Update

New Committees

Status on March 2021 Joint Documents

Recent Publications

Upcoming Meetings

ICAO Update

Other International Efforts
• New WG: reactivation of WG-95 Inflight Ice Detection (joint with SAE) to revise ED-103A/ARP 5498A

• No new WG currently proposed, except joint discussion on spectrum future activity
• DO-376 (New Document) – Minimum Operational Performance Standard (MOPS) for Offshore Helicopter Terrain Awareness & Warning System (HTAWS), presented by SC-237, Helicopter Terrain Awareness Warning System, 1 request for an editorial change (membership list)
  • ED-285 Council approval ends 18 March, so far only positive votes

• DO-389 (New Document) – OSED for Counter UAS in Controlled Airspace, presented by SC-238, Counter Unmanned Aircraft Systems
  • ED-286 Council approval ends 18 March, so far only positive votes, 1 request for an editorial change (membership list)
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<td>Software Tool Qualification Considerations Corrigendum 1</td>
<td>2/15/2021</td>
<td>DO-330 not identical</td>
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<td>WG-51 SG-1</td>
<td>ED-102B</td>
<td>MOPS for 1090 MHz Extended Squitter ADS-B and TIS-B</td>
<td>1/6/2021</td>
<td>DO-260C</td>
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<tr>
<td>WG-121</td>
<td>ED-287</td>
<td>Guidance Document on Aircraft Cleaning and Disinfection</td>
<td>12/24/2020</td>
<td>DO-388</td>
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<tr>
<td>WG-75 SG-1</td>
<td>ED-275 Vol. II</td>
<td>Minimum Operational Performance Standard (MOPS) for ACAS Xu - Volume II - Algorithm Design Description (ADD)</td>
<td>12/21/2020</td>
<td>DO-386</td>
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<tr>
<td>WG-51 SG-3</td>
<td>ED-236A Ch. 1</td>
<td>Minimum Operational Performance Standards (MOPS) for Flight-deck Interval Management (FIM) Change 1</td>
<td>12/21/2020</td>
<td>DO-361A Ch. 1</td>
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<tr>
<td>WG-105 SG-61</td>
<td>ED-280</td>
<td>Guidelines for UAS safety analysis for the Specific category (low and medium levels of robustness)</td>
<td>12/10/2020</td>
<td>Not Joint</td>
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</table>
Upcoming EUROCAE Meetings

• Symposium is 28-30 April 2021, fully virtual event

• Next TAC meetings:
  • TAC#86 20 April 2021, Saint-Denis, EUROCAE/virtual meeting
  • TAC#87 6-7 July 2021, Saint-Denis, EUROCAE/virtual meeting
• Questions?
Agenda Item 7A:
RTCA 2021 Award Nominations

Karan Hofmann
PMC Secretary
March 18, 2021
RTCA Paper No: 061-21/PMC-2123
<table>
<thead>
<tr>
<th>Document Number and Title</th>
<th>SC</th>
<th>Award: Outstanding Leadership</th>
<th>Award: Significant Contributors</th>
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<tbody>
<tr>
<td>AFS-2: Feasibility Study: Airborne LIDAR for Clear Air Turbulence Detection</td>
<td>230</td>
<td>Venkata Sishtia (Collins Aerospace)</td>
<td>Dr. Patrick Vrancken (German Aerospace Center DLR)</td>
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<td></td>
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<td>Jeff Finley (Collins Aerospace)</td>
<td>Dr. Shumpei Kameyana (Mitsubishi Electronic Corporation)</td>
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<tr>
<td>DO-181F: Minimum Operational Performance Standards for Air Traffic Control Radar Beacon</td>
<td>209</td>
<td></td>
<td>Tim Steiner (Federal Aviation Administration)</td>
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<td>System/Mode Select (ATCRBS/Mode S) Airborne Equipment</td>
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<tr>
<td>DO-204B Change 1: Minimum Operational Performance Standard for Aircraft Emergency</td>
<td>229</td>
<td></td>
<td>John Fisher (Federal Aviation Administration)</td>
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<tr>
<td>Locator Transmitters 406 MHz</td>
<td></td>
<td></td>
<td>Chris Hoffman (ACR Electronics)</td>
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<td>DO-210D Change 5: MOPS for Geosynchronous Orbit Aeronautical Mobile Satellite Services</td>
<td>222</td>
<td></td>
<td>Richard Tapp (Honeywell International)</td>
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<tr>
<td>(AMSS) Avionics</td>
<td></td>
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<tr>
<td>DO-229F: Minimum Operational Performance Standards for Global Positioning System</td>
<td>159</td>
<td>Kevin Bean (The MITRE Corporation)</td>
<td>John Barry (Federal Aviation Administration)</td>
</tr>
<tr>
<td>Satellite-Based Augmentation System Airborne Equipment</td>
<td></td>
<td></td>
<td>Barbara Clark (Federal Aviation Administration)</td>
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<td>Document Number and Title</td>
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<td>Award: Significant Contributors</td>
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</table>
| DO-260C: Minimum Operational Performance Standards (MOPS) for 1090 MHz Automatic Dependent Surveillance - Broadcast (ADS-B) | 186 | Tom Pagano (Regulus Group)                           | - Tim Steiner (Federal Aviation Administration)  
- Steve Darr (Dynamic Aerospace, Inc.) |
| DO-262E: MOPS for Avionics Supporting Next Generation Satellite Systems (NGSS)            | 222 |                                                    | - Richard Tapp (Honeywell International, Inc.)  
- Darrell Andgregg (Collins Aerospace) |
| DO-317C: Minimum Operational Performance Standards (MOPS) for Aircraft Surveillance Applications (ASA) System | 186 | Leslie Weitz (The MITRE Corporation)  
Brenda Perez (Regulus Group) | - Christine Haissig (Christine Haissig Consulting LLC)  
- Greg Comstock (StratMach) |
| DO-328B: Safety, Performance and Interoperability Requirements Documents for Airborne Space – Flight Deck Interval Management (ASPA-FIM) | 186 | Greg Comstock (StratMach)  
William Penhallegon (The MITRE Corporation) | - Stephanie Priess (The MITRE Corporation)  
- Brenda Perez (Regulus Group) |
| DO-343C: MASPS for AMS(R)S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP) | 222 |                                                    | - Andrew Ives (Inmarsat) |

**Note**: SC represents the Scoring Category.
<table>
<thead>
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<th>Document Number and Title</th>
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<tr>
<td><strong>DO-355A: Information Security Guidance for Continuing Airworthiness</strong></td>
<td>216</td>
<td>David Pierce (GE Aviation)</td>
<td>Mark Kelley (AVISTA)</td>
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<tr>
<td><strong>DO-361A: MOPS for Flight-Deck Interval Management (FIM)</strong></td>
<td>186</td>
<td>Greg Comstock (StratMach)</td>
<td>Eltzafan Mark (Federal Aviation Administration)</td>
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<td>Randy Bone (The MITRE Corporation)</td>
<td>Stephanie Priess (The MITRE Corporation)</td>
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<tr>
<td><strong>DO-361A Change 1: Minimum Operational Performance Standards (MOPS) for Flight-deck Interval Management (FIM) Change 1</strong></td>
<td>186</td>
<td>Stuart Bowman (The MITRE Corporation)</td>
<td>Peter Stassen (The MITRE Corporation)</td>
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<td></td>
<td>Christine Haissig (Christine Haissig Consulting LLC)</td>
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<td><strong>DO-362A: Command and Control (C2) Data Link Minimum Operational Performance Standards (MOPS) (Terrestrial)</strong></td>
<td>228</td>
<td>Tyler Barney (Collins Aerospace)</td>
<td>Kurt A. Shklhauser (National Aeronautics and Space Administration)</td>
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<td></td>
<td></td>
<td>Jim Williams (JHW Unmanned)</td>
<td>Al Malaga (Advantage Consulting Engineering Services)</td>
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<td>Xavier Esneu (Collins Aerospace)</td>
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<tr>
<td><strong>DO-365A: MOPS for Detect and Avoid (DAA) Systems</strong></td>
<td>228</td>
<td>Don Walker (Airbus)</td>
<td>Tim Grebe (General Atomics)</td>
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<td></td>
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<td>Ted Lester (GE Aviation)</td>
<td>Devin Jack (Adaptive Aerospace)</td>
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<td>Gilbert Wu (National Aeronautics and Space Administration)</td>
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<td><strong>DO-366A: Minimum Operational Performance Standards (MOPS) for Air-to-Air Radar for Traffic Surveillance</strong></td>
<td>228</td>
<td>Naiel Askar (General Atomics)</td>
<td>Gilbert Wu (National Aeronautics and Space Administration)</td>
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<td>Siva Aivananthan (ARCON Corporation)</td>
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<td>Jessica Lopez (JHU/APL)</td>
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<td>Takeoff Minima by Use of Enhanced Flight Vision Systems</td>
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<tr>
<td>DO-380: Environmental Conditions and Test Procedures for Ground Equipment</td>
<td>135</td>
<td>Kyle McMullen (NIAR)</td>
<td>Jake Van Dyke (Honeywell)</td>
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<td></td>
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<td>Brad Green (Retired from EaglePicher Technologies, LLC)</td>
<td>David Jerrel (General Atomics)</td>
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<td>DO-381: MOPS for Ground-based Surveillance System (GBSS) for Traffic Surveillance</td>
<td>228</td>
<td>Jonas Trego (General Atomics)</td>
<td>Michael Dubois (Raytheon)</td>
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<td>DO-382: Minimum Aviation System Performance Standards CAS Interoperability</td>
<td>147</td>
<td>Garfield Dean (EUROCONTROL)</td>
<td>Ann Drumm (MIT Lincoln Laboratory)</td>
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<tr>
<td>DO-383: Guidance on Air to Ground VDL Mode 2 Interoperability</td>
<td>214</td>
<td>Claire Robinson (formerly Spectralux now Universal Avionics)</td>
<td>Zbigniew Jasiukajc (SITA)</td>
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<td>Dongsong Zeng (The MITRE Corporation)</td>
<td>Lynn Root (Universal Avionics)</td>
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<td>DO-384: Minimum Operational Performance Standards (MOPS) for GNSS Aided Inertial Systems</td>
<td>159</td>
<td>Mats Brenner (Honeywell International, Inc)</td>
<td>Alain Guillet (Airbus)</td>
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<td>- James Doty (Collins Aerospace)</td>
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<td>DO-386 Voll and Vol II: Minimum Operational Standards for Airborne Collision Avoidance System Xu (ACAS Xu)</td>
<td>147</td>
<td>Charlie Leeper (Johns Hopkins Applied Physics Laboratory)</td>
<td>Alan Sigman (Federal Aviation Administration)</td>
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<td>- Jessica Lopez (Johns Hopkins Applied Physics Laboratory)</td>
<td>- Samuel Wu (MIT Lincoln Laboratory)</td>
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<td>- Samantha Smearcheck (Johns Hopkins Applied Physics Laboratory)</td>
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<td>- Iva Pluhackova (International Air Transport Association)</td>
<td>- Chad Johnson (Transport Canada)</td>
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<td>- Hal Adams (Avia Global Group)</td>
<td>- Bryan Moran (The Boeing Company)</td>
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<td>White Paper: Recommended Solutions to Address TAWS Manual Inhibition CFIT Cases Raised by NTSB Safety Recommendations A-17-035 and A-18-015 and GAJSC CFIT WG SE-54</td>
<td>231</td>
<td>Yasuo Ishihar (Honeywell International, Inc.)</td>
<td>Zach Reynolds (L3Harris)</td>
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<td>- Rick Rideour (L3Harris)</td>
<td>- Rich Adler (Federal Aviation Administration)</td>
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<td>- Linda Chism (Alaska Airlines)</td>
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<td>- Max Fenkell (formerly Aerospace Industries Association now Joby Aviation)</td>
<td>- David Redman (Aerospace Vehicle Systems Institute)</td>
</tr>
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</table>
Special Committee Leadership request PMC approval for these outstanding individuals
Agenda Item 7B:
SC-135
Environmental Test
Revised TOR

Kyle McMullen, SC-135 Chair
Technical Director – WSU/NIAR WERX

March 18, 2021
RTCA Paper No: 069-21/PMC-2129
Scope of Committee

• Environmental Testing of Aircraft Components.
• Work still progressing on DO-160H release of 12/2024.
• Plan is to update DO-357 to DO-357A for release on 12/2024.
Scope of Changes to TOR

• Brad Green has retired as Co-Chair.
• Kyle McMullen has becomeSolo Chair.
• Lee Nguyen has retired as GAR of SC-135.
• Replacement to be added.
Scope of Changes to TOR

• Change – DO-380A
  • Due to difficulty in finding experts and participants, request to move this revision out to 12/2025.
  • No change proposals submitted as of today to this document.
    • Would be best to allow this document to be used by industry and let industry come back with changes.
    • As the UAS and Urban Mobility industries mature, then we expect for participation and usage of DO-380

• Change – DO-380B
  • Removed this revision completely.
Scope of Changes to TOR

• Change – Scopes
  • Some of these scopes are proving difficult to accomplish.
  • Need guidance from PMC on how to address, if these can’t be closed by DO-160H release.
  • Can these be removed as justification is produced from the TOR?
  • Does PMC want these removed as one, when the document releases?
Conclusion

• SC-135 Continues to do great work with great people!
• We appreciate the support from PMC and RTCA!
Agenda Item 7C:
RTCA Research & Development Collaboration

Terry McVenes
RTCA President
March 18, 2021
RTCA Paper No: 073-21/PMC-2133
“Research and development is the precursor to standards development”

- Current R&D Activities
  - FAA – ACY
  - Industry
  - Academia
  - Research, Engineering and Development Advisory Committee (REDA)

- MOA Between FAA AVS and ANG – joint collaboration on FAA R&D

- RTCA Center of Excellence

PMC Discussion Item

What is the role of RTCA’s PMC in R&D collaboration with government, industry, and academia and what is the best venue to support it?
Agenda Item 7D:
RTCA/EUROCAE/ICAO Collaboration

Terry McVenes
RTCA President
March 18, 2021
RTCA Paper No: 075-21/PMC-2135
RTCA/EUROCAE/ICAO Collaboration

• Technical Information Sharing Agreement – December 2017

• Fifth Standards Roundtable Meeting – September 2019
  • Work Program Alignment

• RTCA/EUROCAE Discussions
  • Annual/Semi-Annual Coordination Meeting
  • Observer Status – PMC/TAC

• RTCA/EUROCAE/ICAO ANB Meeting – February 26, 2021
  • Not good alignment between SRT/Agreement and the ANC Commissioners
  • Need for confidence building measures between ICAO and SDOs
  • Concerns about power shifting from ICAO to SDOs
RTCA/EUROCAE/ICAO Collaboration

• Next Steps
  • ANB (Steve Creamer) – work with Air Navigation Commission
  • ICAO panel job cards – get information from SDOs about current standards
  • Grant ICAO observer status to the RTCA PMC/EUROCAE TAC

• Proposal

  RTCA Program Management Committee approve ICAO Air Navigation Bureau observer status to the PMC to optimize future communications and alignment with ICAO SARPS development
Agenda Item 7E:
SC-228 Terms of Reference Update Request

March 18, 2021
RTCA Paper No: 065-21/PMC-2127
Use of LTE Networks for UAS C2

• Current TOR for SC-228:
  • “Create standard for use of LTE commercial networks for C2 Link Systems used for type certificated UAS.”
  • FRAC Completion Due Date - January 2023

• Significant industry interest in a common FAA/EASA/TC standard to expand the market worldwide
  • January 2021 EUROCAE TAC approved request to develop a joint document with RTCA
  • EUROCAE WG-105 formed a Subgroup to start development of the MOPS in February

• Request PMC to revise SC-228 TOR to permit the development of a joint document for LTE C2 Links
## TOR Language Updates for LTE Based C2

<table>
<thead>
<tr>
<th>C2 Link MOPS for LTE Networks</th>
<th>Create a joint standard with EUROCAE WG-105 for use of LTE commercial networks for C2 Links used for type certificated UAS</th>
<th>January 2023</th>
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</table>

### C2 Data Link — Phase Three Activities

Phase Three activities are focused on creating a standard for use of LTE commercial networks for C2 Links used for type certificated UAS as part of a new standalone MOPS. This MOPS would be modeled on the SC-228 SATOM documents that consider the installed base of an existing communications system and address the safety requirements for its use as a C2 Link System. Additional frequency bands proposed for use could be added to the new MOPS structure if support from avionics companies and the network provider obtain approval from the PMC to increase the scope beyond generic LTE/5G services. This document will be developed jointly with EUROCAE WG-105 to enable a common standard for avionics using standardized LTE services offered worldwide.

### New C2 Scope
- Create a joint standard with EUROCAE WG-105 for use of LTE commercial networks for C2 Links used for type certificated UAS.
• DO-377A MASPS for C2 Datalink FRAC complete date moved from April 2021 to July 2021
  • DO-362A was reprioritized by WG2 due to pending loss of NASA resources such that DO-362A was delivered three months ahead of schedule and DO-377A is being delayed by three months.

• DO-381A Ground-Based (Primary) Surveillance System (GBSS) MOPS delayed to April 2022
  • Scope: Expanding Ground-Based (Primary) Surveillance System (GBSS) from terminal to en route environment
  • Key Challenge: Identifying funding for Modeling and Simulation resources to do the appropriate groundwork
  • Sponsorship: We still have two member companies (Raytheon, BAE Systems) who desire to continue further development of this standard.
Agenda Item 7G:
RTCA/EUROCAE 2021 Software Symposium

Terry McVenes
RTCA President
March 18, 2021
RTCA Paper No: 074-21/PMC-2134
RTCA and EUROCAE co-hosting a Software Symposium provides an opportunity to demonstrate leadership in software standards development and bring the industry and regulators together for education and collaboration. The event presents a platform to conduct important conversations, better equipping both organizations to adapt to the needs of newer entrants.

**Outcomes**

**Demonstrated Leadership** - in software standards development  
**Attract New Members** - especially from new entrant segments  
**Optimized Information Sharing** – regulatory and industry technical sessions  
**Foundational** - future in-person revenue-generating event
Intended Audience – Job Roles
Software Developers, Engineers, Technical Team Leads, Analysts, Quality Assurance, Safety, Installers, Regulators

Intended Audience - Industry Segments
Government organizations
Universities
Manufacturers – Avionics
Manufacturers -Aircraft (manned and unmanned)
Autonomous vehicles
Engineering Firms
R&D firms
Maintenance Facilities/Avionics Shops
RTCA/EUROCAE 2021 Software Symposium

June 23 – 24, 2021

Program Overview
2.5 hours of live programming each day with Q&A
Additional on-demand content

Topics:

1. Practical Software Development for today’s Aviation ecosystem
2. Regulatory framework: how it relates to software with specific examples in UAM, UAS, driverless cars, autonomous software
3. How the industry uses supplements to assist with system certification
4. Challenges for UAM control software certification
5. And more
Agenda Item 8:
• Next Meeting Documents

Karan Hofmann
RTCA PMC Secretary
• SC-213, Enhanced Flight Vision Systems/Synthetic Vision Systems
  • New Document – *Test Procedures for Qualified Visual Advantage*

• SC-222, Aeronautic Mobile Satellite (Route) Services (AMS(R)S)
  • 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*

• SC-240, Topics of Software Advancement
  • New Document – *Software Considerations in Lower Risk Applications, Equipment Certifications and Approvals*
• June 17, 2021
• September 16, 2021
• December 16, 2021
• March 17, 2022?
March Action Item Review
ADJOURN