



RTCA Paper No: 263-24/SC227-086

EUROCAE Paper No:

**Minutes of 39<sup>th</sup> RTCA Special Committee 227 Meeting  
Joint with EUROCAE WG-85 4D Navigation Performance, 36<sup>th</sup> Meeting**

**2024, May 6 – May 10**

**Hybrid: Virtual and in-person**

**Monday - Friday: The Boeing Company (Jeppesen)**

**Building 1 World Headquarters**

**55 Inverness Drive East**

**Englewood, CO 80112**

**AGENDA (AS Published)**

**Monday May 6, 2024 – Wednesday May 8, 2024, Starting 8 AM (Local Time) –  
Working Sessions**

On Monday, the full group will be available to discuss working meeting plans for the week. Working meetings will start each day at 8am MT.

Note: WG#3 has working meetings each day and welcomes participation from WG#1 and WG#2 members.

Note: As of March 20, currently there is not a reason for WG#1 and WG#2 to meet separately about the MASPS and MOPS on Monday – Wednesday, but there’s a risk that will change, pending availability of the draft, updated MASPS and MOPS.

- WG#1 and WG2 members are encouraged to attend on these days to support WG#3.
- To arrive “early” for WG#3 would enable participating in-person for any separate discussions that might become necessary for WG#1-2.

**Thursday, May 9, 2024, 8 AM to 4 PM (Local Time) – Plenary – Day 1**

1. Welcome and administrative remarks, and review of RTCA/EUROCAE Policies
2. Introductions



3. Discussion of the Status of comment resolution on DO-283C/ED-323
4. Consider a motion to approve closing the FRAC/OC process by accepting the implementation of all comments for DO-283C/ED-323
5. Discussion of the status of comment resolution on DO-236E/ED-75F
6. Consider a motion to approve closing the FRAC/OC process by accepting the implementation of all comments for DO-236E/ED-75F
7. Discussion of WG-3 Approved Change Proposals and working papers.

**Friday, May 10, 2024, 8 AM to 2 PM (Local Time) – Plenary – Day 2**

1. Consider a motion to send DO-236E/ED-75F to RTCA and EUROCAE for publication.
- 2. 8:30am FIM/TOAC (Kimberly Brooks)**
3. Consider a motion to send DO-283C/ED-323 to RTCA and EUROCAE for publication.
4. Continue with WG-3 approved change proposals and working papers.
5. Any other business
6. Review Action Items
7. Adjourn

Plenary meeting may adjourn early if all business is completed. This meeting will allow remote participation. Connection details can be obtained by contacting Mark Watson or Rebecca Morrison.

**ATTENDEES**

Chairpersons:

- EUROCAE WG-85 Okuary Osechas, Zurich University of Applied Sciences (ZHAW)
- RTCA SC-227 Ellen McGaughy, Collins Aerospace

EUROCAE WG-85 TPM: Mark Watson

RTCA Program Director: Rebecca Morrison

RTCA GAR: Barry Miller, FAA Aircraft Certification

Acting Secretary: None

Others attending:

| Name | Company |
|------|---------|
|------|---------|



|                 |  |
|-----------------|--|
| Aaron Jacobson  | Boeing   |
| Andrew Riedel   | Boeing   |
| Atsushi Kezuka  | Electronic Navigation Research Institute (ENRI)      |
| Bennie Hutto    | National Air Traffic Controllers Association (NATCA) |
| Benoit Legault  | CMC  |
| Bill Tuccio     | Garmin   |
| Binciril Mathew | Honeywell  |
| Bridget Kelley  | MITRE  |
| Cameron Little  | Naval Air Systems Command (NAVAIR)                   |
| Barry Miller    | FAA  |
| Bill de Groh    | ALPA   |
| Brad Miller     | FAA  |
| Collin Ogden    | Collins Aerospace                                    |
| Craig Boxrucker | ALPA   |
| Daniel Nelson   | NATS   |
| Dimitri Garbi   | EASA   |
| Ellen McGaughy  | Collins Aerospace                                    |
| Erik Ringnes    | Honeywell  |
| Ferraro Davide  | Leonardo Company                                     |
| Francis Govers  | Collins Aerospace                                    |
| Gang Feng       | Boeing   |
| Gerhard Berz    | EUROCONTROL  |
| Jeff Meyers     | FAA  |
| Jarret Hudson   | Textron Aviation                                     |
| Joel Dickinson  | FAA Flight Standards                                 |
| John Barry      | FAA Aircraft Certification                           |
| John Romine     | Collins Aerospace                                    |



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|--------------------|--|
| Keith Neuhart      | Boeing   |
| Kendal Hershberger | Garmin   |
| Kevin Schwemmer    | Textron  |
| Kimberly Brooks    | FAA  |
| Kyle Jermyn        | Boeing/Jeppesen  |
| Lesley Weitz       | MITRE  |
| Matthew M. Lug     | US Air Force   |
| Monica Vafiades    | US Air Force   |
| Nat Beeten         | US Air Force   |
| Nathan Land        | Delta Airlines   |
| Phillip Pankratz   | Textron Aviation   |
| Regina Richardson  | Naval Air Systems Command<br>(NAVAIR)                    |
| Reuss Anderson     | Garmin   |
| Stephen Moody      | Boeing/Jeppesen  |
| Steve Horvath      | Garmin   |
| Stuart Bowman      | MITRE  |
| Sylvain Raynaud    | Airbus   |
| Tim Geels          | Collins Aerospace  |
| Tim Padden         | US Air Force   |
| Tom Yochum         | Boeing   |
| Tom Zarick         | NATCA  |
| Toyohachi YOKOTA   | Japan Radio Air Navigation Systems<br>Associate (JRANSA) |
| Trent Prange       | FAA  |
| Valeriu Vitan      | EUROCONTROL  |
| Vijay Pisini       | Collins Aerospace  |
| Wes Googe          | American Airlines  |

## **MINUTES**



### **Monday, May 6, 2024 – Working Group Sessions**

- WG#1 and WG#2: Continued resolving FRAC comments.
- WG#3: Continued developing Change Proposals and addressing Action Items.

### **Tuesday, May 7, 2024 – Working Group Sessions**

- WG#1 and WG#2: Continued resolving FRAC comments.
- WG#3: Continued developing Change Proposals and addressing Action Items.

### **Wednesday, May 8, 2024 – Working Group Sessions**

- Special topic: GNSS Spoofing and Jamming
  - EASA member presented an “Update on GNSS Jamming/Spoofing Issues.”
  - EUROCONTROL / EUROCAE WG-107 presented “Request for Multi-Sensor Navigation Capability Evolution.” They would like to see harmonized “integration upgrades” with FMS, DFMC GNSS, INS and DME.
  - The outcome of the presentations was as request to SC-227/WG-85 to continue working this topic after closure of current FRACS for DO-236E and DO-283C.
- WG#1 and WG#2: Continued resolving FRAC comments.
- WG#3: Continued developing Change Proposals and addressing Action Items.

### **Thursday, May 9, 2024 – Plenary**

- Preamble: At 8am the Plenary meeting opened with introductions, and overviews of policies and planned work for the week. Participation was in person and virtual via WebEx.
- Minutes: The SC-227 Plenary #38 Minutes from the Jan 29-Feb 2, 2024, meeting in Washington DC were reviewed and accepted.
- Recognized losses since the last Plenary in Washington DC: SC-227 members Bob Gaul and Mike Cramer, and Boeing/Jeppesen Steve DeRosear.



- WG#1 and WG#2 RNP for RNAV MASPS and MOPS status:
  - RTCA PMC approved SC-227 Revision 17 (TOR-17), including a revision to extend the schedule to finish DO-236E and DO-283C until 2024, November. (See WG#3 status for additional changes in TOR-17 for DDC/EACD.)
  - All FRAC items have been resolved except for incorporating changes to remove RNP RNAV (with associated revisions to RNP and RNAV) in the MASPS and MOPS.
  - Whether to simultaneously close FRACs of draft DO-236E and draft DO-283C and submit the documents to RTCA and EUROCAE for publication was considered and rejected. Instead, the current FRAC will remain open, and there will be more telecon working sessions to finish reviewing the MASPS and MOPS “side-by-side”. After all the current FRAC comments are incorporated in the documents to everyone’s satisfaction (as reviewed in pdf files), there will be a re-FRAC for new issues that were identified in this week’s working sessions. The plan is to start the re-FRAC with time to complete the open comment period before the next Plenary in August 2024.
  - New Action Item: WG#1 and WG#2 need to prepare a request to ICAO for permission to use specific material in ICAO documents. The request should be presented at the next Plenary.
- WG#3 Data Driven Charts/Electronic Aeronautical Chart Displays:
  - RTCA PMC approved TOR-17, including an update to publish a new “DO-ZZT” with a new title instead of revising the current DO-257B.
  - Overlooked WG3 Action Items. The schedule is still on track per the current TOR-17.
  - C10107 Standardized Symbols was discussed but not accepted.



- If needed, WG-3 should draft a request for SAE for permission to re-use ARP 5289A standard symbol set. Such a request should be presented for SC-227 approval at a future Plenary.
- C10147 Update to align Table 2-1 (existing EMD section) with Table G-1 was discussed and accepted.
- C10033 Symbols, Labels, Data Fields, Controls was discussed and accepted.
- C10140 Declutter Examples was discussed and accepted.
- C10126 EACD General Requirements Section was discussed and accepted.
- C10116 Adapt and Update Table 2-1 for EACD section was discussed and accepted.
- C10117 Define Standards for Independent Databases was discussed but not accepted.
- Thursday's Plenary concluded.

#### **Friday, May 10, 2024 - Plenary**

- At 8am Plenary resumed.
- At 8:30am, MITRE and FAA presented, "Proposed Approach for TOAC Maturation in SC-227". MITRE determined that they need to run simulations to determine if the existing MASPS/MOPS requirements are sufficient or if additional requirements and changes are needed. MITRE recommends/requests new SC-227 scope (an RTCA report) for MITRE to work directly with manufacturers with mutual benefit to all parties to:
  - Validate MASPS/MOPS requirements in MITRE simulations, analogous to what MITRE did for SC-186, to determine whether new requirements are needed or whether existing requirements need to be changed or could be relaxed (e.g. ETA Accuracy).
  - Develop common set of dynamic test scenarios for manufactures to use in approving RNP Equipment.



- Guide FAA ConOps and Airspace planning based on the findings.
- Next meetings
  - 2024, August 19-23, 2024, location Cedar Rapids, IA
    - Schedule Plenary to finish on Thursday. There will be no Plenary on Friday, only Working Groups on Friday,
  - 2024, Nov. 18-22, location **not** yet confirmed (tentatively Brussels, EASA).
  - 2025, Feb 3-7, location Wash DC, RTCA (dates and location are tentative, not yet finalized)
  - 2025, May 19-23, location **not** yet confirmed (tentatively Wash DC, RTCA)
- WG#3 (DO-ZZT)
  - C10036 Plan View Map for DDC was discussed and accepted with follow-on action items.
  - C10142 Introduction to the Minimum Information Catalogue was discussed and accepted.
  - WG#3 Parking Lot Items reviewed: Because the technology is not yet sufficiently mature, the following are not planned for this initial release but could be considered for a future revision:
    - D10136 Should Terrain be added on DDC Profile
    - D10135 Should Ownship be added on DDC Profile
- Action Items:
  - For WG#1 and WG#2, draft TOR changes for new scope, after publishing DO-236E and DO-283C,
    - To prepare a report with recommendations for addressing GNSS resilience jointly with WG-85
    - For manufacturers to work directly with MITRE with mutual benefit to all parties to





- Validate MASPS/MOPS requirements in MITRE simulations, analogous to what MITRE did for SC-186, to determine whether new requirements are needed or whether existing requirements need changed or could be relaxed (e.g. 1% ETA and TOAC).
- Develop common set of dynamic test scenarios for manufactures to use in approving RNP Equipment for TOAC and 1% ETA.
- MITRE results will guide FAA ConOps and Airspace planning.
- WG#1 and WG#2 need to prepare a request to ICAO for permission to use specific material in ICAO documents. The request should be presented at the next Plenary.
- New Business: Per the immediately preceding Actions Items
- Plenary concluded.

**Webex/Meeting Adjourned**