Program Management Committee Meeting

July 13, 2017

RTCA
Welcome & Introductions

Chair

Chris Hegarty, MITRE
PUBLIC MEETING ANNOUNCEMENT
Read by: Designated Federal Officer Lou Volchansky
Program Management Committee
July 13, 2017

In accordance with the Federal Advisory Committee Act, this Advisory Committee meeting is OPEN TO THE PUBLIC.
Notice of the meeting was published in the Federal Register on:

June 27, 2017

With the approval of the Chairman, members of public may present oral or written statements at the meeting.
Persons wishing to present or obtain information should coordinate with RTCA PMC Secretary – Karan Hofmann and the Chairman – Chris Hegarty
Proprietary Policy

- RTCA develops comprehensive, industry-vetted and endorsed recommendations for the regulatory authorities and the aviation community on issues ranging from technical performance standards to operational concepts for air transportation. Supporting this hallmark of RTCA foundational goals to procure consensus for recommended performance standards, the preferred and highly endorsed method for producing RTCA documents is to do so **without reference to proprietary information**. Although this type of reference in an RTCA document is not prohibited *per se*, it is limited to those circumstances where the objective of the document cannot reasonably be attained without the reference(s). Before incorporation into an RTCA document, three tests must be met:
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  - 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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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 in the Federal Register. 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.
Review / Approve Meeting Summary
May 31, 2017
RTCA Paper No. 143-17/PMC-1618
Review / Approve Administrative SC TOR Revisions

SC-159: RTCA Paper No. 164-17/PMC-1626

New Secretary and Deliverable “clean up”
Agenda Items 3-A and 3-B: Publication Consideration/Approval of LAAS MOPS (DO-253D) and ICD (DO-246E)

RTCA Program Management Committee

July 13, 2017

RTCA Paper Nos. 120-17/PMC-1809 and 101-17/PMC-1607
SC-159 Committee Status

Committee Organization
- Co-Chairs: Chris Hegarty, George Ligler
- DFO: Ken Alexander
- 6 active sub-groups
- 274 SC members on Workspace Roster

Working Group 4 (GBAS/LAAS) Specific
- Co-Chairs: Joel Wichgers, Matt Harris
- 113 members on Workspace Roster
- **Work Products:**
  - Revision of RTCA GPS/LAAS Airborne MOPS (DO-253 rev. C to D)

- **Rationale for Near Term Updates to LAAS MOPS and ICD**
  - Revise MOPS Requirements and ICD in harmony with ICAO GBAS SARPs update to Incorporate GAST D Service Capable of Supporting GPS L1 LAAS-based Cat. II/III Precision Approach and Takeoff Operations
  - VDB Update: 1) Link Budget Update to Give 8 dB More Ground Tx Siting Flexibility by reducing Aircraft Installation Loss (AIL) Range by 8 dB and reducing the allowable antenna gain variation, 2) Defined Second Class of VDB Receiver that accommodates aircraft with AIL outside the Class A standardized AIL range, and 3) With Link Budget Update, enhancing description of the VDB Link Budget rationale (Appendix K)
    - Work in Harmonization with ICAO NSP GWG and SWG to: 1) support Compatibility Assessment with ILS, VOR, and VHF Comm. Systems, 2) support requirements changes to support antenna diversity, and 3) define assumptions associated with VDB elevation pattern.
  - Maintenance updates
Final Review and Comment (FRAC)

- Begin FRAC
  - LAAS LAAS MOPS (DO-253D): February 3, 2017
  - LAAS LAAS ICD (DO-246E): February 2, 2017

- End FRAC
  - Both LAAS MOPS and ICD: March 7, 2017

- Resolution of FRAC Comments WG-4 Plenary Meetings
  - Telecon/WebEx: March 8 – 10, 2017
  - Meetings this Week: March 14 – 16, 2017
  - Next few weeks: Editors to implement resolutions (including any editorial items identified)

- SC-159 Approval at Plenary on May 11, 2017
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Resolved All **LAAS ICD (DO-246E) FRAC Comments**

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Significant Comments Included

- VDB Adjacent Channel Interference Requirements
  - VDB Adjacent Channel interference requirements specified in MOPS are harmonized with the ICAO Annex 10 GBAS SARPs
  - ICAO NSP Spectrum Working Group (SWG), with support from RTCA SC-159 WG-4, is updating the GBAS SARPs frequency compatibility criteria that are intended to be effective in November 2020
  - Intend MOPS remains harmonized with the ICAO Annex 10 GBAS SARPs, including changes to the avionics D/U requirements that may result from updating the GBAS SARPs frequency compatibility criteria.
  - Included notes to this effect in the MOPS, which successfully resolved the comments

- A Few Requirements and Information That Needed Clarification
  - Cross Correlation
  - Ranging Source Requirements
  - Active Approach Service Type Determination
  - Dual Solution Ionospheric Gradient Monitoring (DSIGMA)
  - Code-Carrier Divergence (CCD)
Publication Consideration/Approval of LAAS MOPS (DO-253D) and ICD (DO-246E)

SC-159 Recommends PMC Approval for Publication of

- DO-253D, RTCA Paper No. 120-17/PMC-1609
- DO-246E, RTCA Paper No. 101-17/PMC-1607
AGENDA ITEM 3-C: PUBLICATION CONSIDERATION/APPROVAL OF GPS/GLONASS L1 RECEIVER MOPS BY RTCA PMC

13 July 2017
RTCA Paper No. 132-17/PMC-1611
Committee Organization
- Co-Chairs: Chris Hegarty, George Ligler
- DFO: Ken Alexander
- 6 active sub-groups
- 274 SC members on Workspace Roster

Working Group 2A (GPS/GLONASS) Specific
- Chair: Victor Iatsouk
- 46 members on Workspace Roster
GPS/GLONASS L1 MOPS Initiated in 2014 by a group of Russian R & D organizations and GNSS avionics manufacturers

On June 18, 2015 the RTCA PMC approved SC-159 Revised TOR including the task to develop New MOPS for GPS/GLONASS (FDMA + antenna) L1-only airborne equipment

FRAC in mid-2016

Extensive review of FRAC Comments, particularly on approach to ensuring appropriate position integrity, resulted in SC-159 Plenary approval of the draft MOPS on May 11, 2017.
DO-316 ("SA-aware" L1 GPS MOPS) as initial basis of development with respect to both MOPS contents and structure

Phased MOPS development (Six drafts towards FRAC version)

Deviations from DO-316 framework driven by:
- intended operational requirements (e.g. no ADS-B);
- backwards compatibility considerations;
- integration of additional requirements (e.g. for antenna from DO-301);
- harmonization with other RTCA GNSS receiver standards (e.g. DO-229E); and
- resolution of FRAC comments.
3G: PMC Consideration/Approval of L1 GPS/GLONASS Receiver MOPS FRAC comment statistics

187 Total Results

Category Breakdown:
- 56 (29.9%) High
- 43 (23.0%) Editorial
- 37 (19.8%) Low
- 31 (16.6%) Medium
- 19 (10.2%) Non-Concur
- 1 (0.5%) Substantive
Assumptions in support of GPS/GLONASS integrity analysis ($P_{sat}, P_{const}$) reviewed and reconfirmed.

Potential fault modes for GPS/GLONASS equipment identified.

Based on prior probabilities for GPS/GLONASS equipment faults, a set of modes identified that must be resolved by FDE to meet the $10^{-7}$ integrity level;

Probability values for missed alert ($P_{ma}$) and failed exclusion ($P_{fe}$) required to meet integrity/continuity levels and be used as the established $P_{ma}$ and $P_{fe}$ requirements in off-line testing;

Using a prototype algorithm off-line testing performed for the fault modes to be resolved by FDE in order to prove feasibility of meeting established $P_{ma}$ and $P_{fe}$ requirements for each mode; and

Based on adopted assumptions and testing results modifications to FDE requirements in FRAC version of MOPS identified and introduced.

Appendix I added to further articulate integrity testing procedures.
All comments obtained from FRAC process have been successfully resolved and the MOPS has been updated accordingly and approved by the SC-159 Plenary

SC-159 recommends that the RTCA Program Management Committee approve for publication RTCA Paper No. 132-17/PMC-1611, the MOPS for GPS/GLONASS (FDMA + antenna) L1-only airborne equipment
3D: SC-206 Presentation of:

Guidance for the Usage of Data Linked Forecast and Current Wind Information in Air Traffic Management (ATM) Operations

July 13, 2017

RTCA Paper No. 116-17/PMC-1608
SC-206 Committee Status

Committee Organization
- Co-chairs: Allan Hart, Rocky Stone
- DFO: Eldridge Frazier
- 4 active sub-groups
- 217 SC members registered in Workspace

SG7 specific
- Co-chairs: Ernie Dash, Michael McPartland
- 51 SG members registered in Workspace
TOR Overview of Deliverable

Scope:
- Develop Guidance for the Use of Data Linked Current and Forecast Wind Information in Air Traffic Management (ATM).
  - Provide guidance for the methodology of reporting and recommended quality of wind information necessary to support operations such as IM and 4D TBO.

Use of Deliverable:
- Guidance will be useful to manufacturers of FMS and other equipment to minimize the impact of wind errors.
  - Additional users include:
    - FAA and standards organizations: in developing/revising procedures and methods for the use of wind information in the generation and execution of clearances
    - Government and industry: to minimize impact of wind errors on the generation of trajectory predictions through services such as MET information, data link, and Airline Operations Center / Flight Planning Service Providers
Summary of Content

- Examines the impact of wind information on 3 ATM operations:
  - Wake Mitigation, Required Time of Arrival (RTA), & Interval Management (IM)
- Includes an overview of and findings related to:
  - Current use of wind information sources by the aircraft and ground systems
- Provides guidance (findings and recommendations) on:
  - Use of wind information and related airspace procedure impacts based on previous and new studies
- Provides initial considerations for:
  - Trade-offs and compromises by industry and the FAA when developing the concepts and procedures for implementing (or upgrading) the 3 ATM operations
- Includes recommendations for:
  - Future work to cover additional factors and other operations not covered
Review of FRAC Process

FRAC: January 9 – February 8, 2017
- 361 comments received
  - Non-concur = 4 (next slide)
  - High = 62
  - Med = 64
  - Low = 78
  - Editorials = 153

April 24, 2017: Distributed redlined document including proposed comment resolutions

May 4, 2017: SC-206 Working Group meeting consensus on FRAC resolutions
Non-concur Inputs

- 4 non-concurs received
- All 4 non-concurs resolved with revisions to document

Subject areas of non-concurs

- Terminal Sequencing and Spacing description (1)
  - Updated description
- Wake data set not consistent with previously published documents (1)
  - Removed list and pointed to DO-364
- RTA compliance (2)
  - Added clarifying text and changed language to “achieving performance goals” in the RTA simulation study rather than specifying compliance with DO-236C Change 1
Recommendation for PMC Approval

Expectation:

• At next SC-206 plenary (accomplished 10 July), SC-206 recommends:

The PMC approve the document for RTCA publication:

   Guidance for the Usage of Data Linked Forecast and Current Wind Information in Air Traffic Management (ATM) Operations
Recommendations for Future Work

**FAA Considerations:**

- Need to establish the alerting and amendment criteria for the MET performance impact thresholds (go, no-go) during ATM application development.
- Need/value for real-time monitoring and verification of the MET forecast model performance.
- Identifying source and benefit of incorporating use of aircraft based observations of winds in ATM applications.
- Simulation research at locations with greater variations in wind conditions (e.g., KEWR).
Recommendations for Future Work

RTCA Considerations:

• Expand the Wind Guidance document to cover additional factors such as:
  • 4D TBO and other ATM applications
    • Dynamic Required Navigation Performance (DRNP)
    • Traffic Aware Strategic Aircrew Requests (TASAR)
  • Impact of altitude constraints on the sensitivity of MET info used in supporting ATM applications
  • Impact of mixed aircraft equipage in an RTA chain
  • IM & Target Aircraft on non-coincident routes
  • Additional aircraft types and FMSs
6A: SC-159 TOR Changes

Covered Under Agenda Item 2B
7A: RTCA SC-206
Aeronautical Information and Meteorological
Data Link Services

Proposed Terms of Reference (TOR) Changes (rev 12)
July 13, 2017

Allan Hart, Co-Chair
RTCA Paper No. 142-17/PMC-1617
SC-206 Overview

Established in 2005 to develop standards for Aeronautical Information Services (AIS) & Meteorological Data Link Services

Leadership

- **Co-Chairs:** Capt. Rocky Stone (United Airlines) & Allan Hart (Honeywell)
- **Designated Federal Official:** Eldridge Frazier (ANG-C61 Weather Research Branch)
- **Secretary:** Tom Evans (NASA)
- **SG1:** (MET/Wake/ATM) Ed Johnson (FAA) & Clark Lunsford (MITRE)
- **SG4:** (EDR MOPS) Tammy Farrar (FAA) & Bill Watts (Delta Airlines)
- **SG5:** (FIS-B UAT MOPS) Paul Freeman (Harris Corp) & John Ferrara (GA Pilot Consultant)
- **SG7:** (Guidance for DL Forecast & Real-Time Wind) Ernie Dash (AvMet) & Michael McPartland (MITLL)

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<td>Safety and Performance Requirements (SPR) for AI &amp; MET Data Link Services</td>
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<td>Concept of Use for AIS and MET Data Link Services</td>
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<td>AIS and MET DL Services Delivery Architecture Recommendations</td>
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<td>Minimum Interoperability Standards (MIS) for Automated Meteorological Transmission (AUTOMET)</td>
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<td>Minimum Operational Performance Standards (MOPS) for Flight Information Services – Broadcast (FIS-B) with Universal Access Transceiver (UAT)</td>
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<td>Develop Guidance for Data Linking Forecast and Real-Time Wind Information to Aircraft</td>
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<td>Update DO-358 MOPS for FIS-B with UAT</td>
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TOR Changes

• DO-358A Minimum Operational Performance Standards (MOPS) for Flight Information Services Broadcast (FIS-B) with Universal Access Transceiver (UAT)
  – Eliminating the generic wording “Define the minimum operational performance standards for the display of FIS-B data for the new products.” and “Modify for existing products and define for the new products the testing requirements for the display of FIS-B data with UAT.”
  – Specify the 6 weather products to be added to the MOPS:
    ➢ Lightning Center Weather Advisory (CWA)
    ➢ Turbulence Graphical Airmen’s Meteorological Advisory (G-AIRMET)
    ➢ Icing Cloud Tops
    ➢ Driven by FAA SBS office request for additional products
  – Specify that this update will “Correct any errors or deficiencies in DO-358 reported to SC-206 or found by SC-206 during the course of the DO-358 update and also advise SBS of any system issues found during the update.” and “Review and modify DO-358 if necessary to match SBS FIS-B system changes since release of the original DO-358.”
  – Change delivery date to PMC from December 2017 to December 2018 based on increase scope

• Change the DO-XXX “In Situ Eddy Dissipation Rate (EDR) Algorithm Performance” document from a Minimum Operational Performance Standards (MOPS) to a Guidelines document
  • Already presented in March PMC, approved in May PMC meeting
Status of SC-206

• SG1
  - Working with the Combined Surveillance Committee (CSC) that contains members from RTCA SC-186 WG3 / EUROCAE WG-51 SG1 and RTCA SC-209 / EUROCAE WG-49.
  - Overseeing SC-206’s 2 ISRAs that address Aircraft-based Observation meteorological parameters contained in DO-364 (AIS/MET DL Services MASPS)
    - SC-186 / WG-51 ADS-B: Revision to ADS-B MOPS, DO-260C (2019)

• The following 2 sub-groups are delayed in releasing their documents due to lack of an approved SC-206 plenary meeting being posted in the Federal Register
  - SG4: EDR Guideline document out for FRAC.
  - SG7: Wind Guidance document to the PMC for approval to release the document

• SG5
  - Working the expanded scope (additional products) as presented in this TOR update request
  - Seeking additional active members to help with the effort
Potential Future Effort

• Coordination is maintained at the leadership level between RTCA SC-206 & EUROCAE WG-76
  – Aware of each others TORs, efforts & status
  – Several re-joining options have been discussed

• Current proposal is to:
  – Not update DO-324 (SPR) or create a new SPR
  – Update DO-364 MASPS following the same SC-206 methodology
    ➢ Add WG-76’s 17 Service Descriptions (next slide)
    ➢ There is some concern with inconsistencies between DO-364 Aircraft based Observation (AbO) requirements and WG-76’s Downlink/Crosslink MET Services’ descriptions
      ❖ SC-206 would prefer Eurocaee adopt the DO-364 WxS service requirements and recommendations, rather than develop their own.
Possible DO-364 MASPS Updated TOC

1 Purpose & Scope (changes due to WG-76’s 17 services)
  1.1 Purpose of Document
  1.2 Introduction
  1.3 Scope (may need to address intended use)
  1.4 Structure of the Document
  1.5 References
  1.6 Glossary
  1.7 Acronyms

2 APPROACH AND METHODOLOGY (no major changes?)
  2.1 Document Development Process
  2.2 Methodology
  2.3 Key Terms

3 Sys Perf Reqs
  3.1 Introduction (changes due to WG-76’s 17 services)
  3.2 Generic Services’ Ops & Safety Req/Rec
    3.2.1 System Level
    3.2.2 Communications Mode Level
    3.2.2.1 Broadcast Mode Requirements
    3.2.2.2 Request-Reply Mode Requirements
    3.2.2.3 Publish-Subscribe Mode Requirements
  3.3 Near Real-Time AbO Services System Req/Rec
    Aircraft-Derived Meteorological Data
    Special Air Reporting
  3.4 Uplink AIM Services
    3.4.1 Airspace Restrictions (Compare to SAA Use Case)
    3.4.2 Digital NOTAM
    3.4.3 Obstacles
  3.5 Uplink MET Services
    3.5.1 Winds & Temperature
    3.5.2 Wind/Temperature Data for Flight Management
    3.5.3 Aerodrome Weather
    3.5.4 Hazardous Weather
    3.5.5 Environmental Conditions in Critical Flight Phases
    3.5.6 Atmospheric Information
    3.5.7 Weather Imagery
    3.5.8 Runway Visual Range
  3.6 Uplink AIM/MET Services
    3.6.1 Digital ATIS
    3.6.2 Runway Information
    3.6.3 Taxiway Information
    3.6.4 Emergency Diversion

4 Interoperability Reqs (changes due to WG-76’s 17 services)
  4.1 Purpose of Interoperability Requirements
  4.2 Scope of Interoperability Requirements
  4.3 Interoperability Requirements and Recommendations
    4.3.1 System-Level Interoperability Requirements
    4.3.2 External Interoperability Requirements
    4.3.3 Internal Interoperability Requirements / Rec

5 Perf Verification (changes due to WG-76’s 17 services)
  5.1 Purpose
  5.2 Guidance for Dev of the Perf Verification Methods Plan
  5.3 Process Methodology
  5.4 Verification of Requirements

Red lettering indicates SC-206 recommended approach to adding the WG-76 services to the current document
Blue lettering indicates dissimilarities and timing issues exist that may preclude incorporation of WG-76 services
## Future Meetings & Major Milestones

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<td>Seattle, WA (Boeing)</td>
<td>Approve Wind Guidance for release to the PMC and EDR Guideline Doc for FRAC</td>
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<td>Sept. 11-15, 2017</td>
<td>Washington, DC (RTCA)</td>
<td>EDR Guideline Doc FRAC resolution review &amp; approval to release the doc to the PMC</td>
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### TOR Deliverables' Schedule

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<th>MOPS for EDR (SG4)</th>
<th>DO-358A FIS-B UAT MOPS (SG5)</th>
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Frel = Release document for FRAC  
Fres = FRAC resolution  
PMC = PMC approval of Document
7B: SC-209 – ACSS CtL

Thomas Pagano
SC-209 Co-Chairman
Next Meeting Documents

**SC-213:**
- New Document – *MASPS for Synthetic Vision System for attitude awareness to address CAST SE 200*

**SC-224:**
- Revision to DO-230G – *Standards for Airport Security Access Control Systems*

Note: Document will be delayed until December 2017 PMC meeting due to not being able to have Plenaries
Next Meeting Documents (cont)

**SC-225:**
- Revision to DO-311 – *Minimum Operational Performance Standards for Rechargeable Lithium Battery Systems*

**SC-228:**
- White Paper for Phase Two DAA MOPS
- White Paper for Phase Two C2
Next Meeting Documents (cont)

**SC-233:**
- New Document – *Addressing Human Factors/Pilot Interface Issues for Avionics*

  Note: Document will be delayed until December 2017 PMC meeting due to not being able to have Plenaries

**SC-235:**
- Revision to DO-227– *Minimum Operational Performance Standards for Lithium Batteries*
Next Meetings

PMC:

- September 21, 2017
- December 13, 2017 (Conflict with ICAO Meeting)
- March 22, 2018
- June 21, 2018
July Action Item Review
ADJOURN