

**RTCA PROGRAM MANAGEMENT COMMITTEE
MEETING SUMMARY
July 13, 2017**

The RTCA Program Management Committee (PMC) convened at 8:30 a.m. on July 13, 2017 at RTCA. The attendance list and action items are attached.

AGENDA ITEM 1

Welcome and Introductions

PMC Chairman Chris Hegarty welcomed the group, asked attendees to introduce themselves and to note their organization of affiliation. Lou Volchansky, the Designated Federal Officer (DFO), read the Public Meeting Announcement that includes the date the Federal Register meeting notice was published, declares the meeting is “Open to the Public” and provides details for persons wishing to present or obtain information pertaining to the meeting.

This was an out-of-cycle meeting to take formal actions upon items discussed at a June 22nd gathering of the PMC members. Formal actions were deferred from the June 22 gathering due to a problem with posting a Federal Register notice for that meeting.

AGENDA ITEM 2

Review / Approve

- A. The summary of the May 31, 2017 meeting was approved with the inclusion of the March 21st summary (RTCA Paper No. 143-17/PMC-1618). PMC members also commented that the June 22nd summary should be included in the summary for the July 13th meeting.
- B. Administrative Special Committee Terms of Reference (TOR) Revision:
 - SC-159 – Navigation Equipment Using the Global Navigation Satellite System (GNSS) – New Secretary and deletion of deliverables (provided approved under Items 3A, 3B, and 3C). The revised TOR was approved (RTCA Paper No. 187-17/PMC-1634).

AGENDA ITEM 3

Publication Consideration/Approval

- A. **Final Draft, Revision to DO-253C – *Minimum Operational Performance Standards for GPS Local Area Augmentation System Airborne Equipment*, prepared by SC-159 (Navigation Equipment Using the Global Navigation Satellite System (GNSS))**

- Dr. George Ligler, SC-159 Co-Chairman, presented at June 22nd meeting

RTCA/DO-253 defines the Minimum Operational Performance Standards (MOPS) for Global Navigation Satellite System (GNSS) airborne equipment augmented with the Local Area Augmentation System (LAAS). The LAAS has global application as a Ground-Based Augmentation System (GBAS) to GNSS.

RTCA/DO-253D supersedes RTCA/DO-253C. RTCA/DO-253D is complementary to the LAAS Interface Control Document (ICD) defined in RTCA/DO-246E. It is also complementary to the International Civil Aviation Organization Annex 10 Volume I GBAS standards and recommended practices (SARPs) for GBAS approach service types C (GAST C) and D (GAST D) as well as the differentially corrected positioning service (DCPS). This revision of DO-253 includes changes resulting from:

- The final validation of GAST D (which is a service capable of supporting approach and landing in Category III conditions) and the approval of Annex 10 with GAST D by ICAO, and
- Maintenance updates for the other GBAS services including GAST C (previously referred to as “Category I precision approach”) and DCPS.

Shortly after presentation in June, Dr. Ligler received an email indicating there was a calculation error in one spot in the document. To proceed with document approval at the July meeting, PMC members requested that the email be forwarded and a corrected DO-253D be posted to workspace. This action was completed on June 26th. (action closed)

The PMC approved the document. It will be published as DO-253D.

B. Revision to DO-246D – *GNSS-Based Precision Approach Local Area Augmentation System (LAAS) Signal-in-Space Interface Control Document (ICD)*, prepared by SC-159 (Navigation Equipment Using the Global Navigation Satellite System (GNSS))

- Dr. George Ligler, SC-159 Co-Chairman, presented at June 22nd meeting

RTCA/DO-246 is the Interface Control Document (ICD) that defines the Signal-in-Space for the Global Navigation Satellite System (GNSS) augmented with the Local Area Augmentation System (LAAS). The LAAS has global application as a Ground-Based Augmentation System (GBAS) to GNSS.

RTCA/DO-246E supersedes RTCA/DO-246D, but the content of this ICD has been maintained to be backward compatible with all LAAS MOPS compliant equipment specified in RTCA/DO-253 as amended by applicable FAA Technical Standard Orders (TSOs).

RTCA/DO-246E is complementary to the LAAS MOPS avionics standard defined in RTCA/DO-253D. It is also complementary to the International Civil Aviation Organization Annex 10 Volume I GBAS standards and recommended practices (SARPs) for GBAS approach service types C (GAST C) and D (GAST D) as well as the differentially corrected positioning service (DCPS). This revision of DO-246 includes changes resulting from:

- The final validation of GAST D (which is a service capable of supporting approach and landing in Category III conditions) and the approval of Annex 10 with GAST D by ICAO, and
- Maintenance updates for the other GBAS services including GAST C (previously referred to as “Category I precision approach”) and DCPS.

The PMC approved the document. It will be published as DO-246E.

C. New Document – *Minimum Operational Performance Standards (MOPS) for GPS/GLONASS L1-only Airborne Equipment, prepared by SC-159 (Navigation Equipment Using the Global Navigation Satellite System (GNSS))*

- Dr. George Ligler, SC-159 Co-Chairman, presented at June 22nd meeting; Dr. Chris Hagerty (SC-159 Co-Chairman) and Victor Iatsouk (SC-159 WG 2A Chairman) presented July 13th

This document defines performance and testing requirements for a combined GPS/GLONASS receiver capable of using GPS and GLONASS L1 signals with Aircraft –Based Augmentation System. The document is primarily based upon RTCA document DO-316 "Minimum Operational Performance Standards for Global Positioning System /Aircraft-Based Augmentation System Airborne Equipment" and defines minimum performance for GPS/GLONASS sensors that provide position information to a multi-sensor system or separate navigation system to be used for enroute, terminal and non-precision approach (NPA) phases of flight. It also includes GPS/GLONASS antenna specifications using as a basis document RTCA DO-301 “Minimum Operational Performance Standards for Global Navigation Satellite System (GNSS) Airborne Active Antenna Equipment for the L1 Frequency Band”.

Note the version discussed today included an editorial error found right after June 22nd meeting that was summarized for PMC members. Additionally, after the June 22nd meeting, it was discovered that this document had not used the values in Annex 10, Volume 1 (with Amendment 90) ICAO SARPs for receivers used for the approach phase of flight or used on aircraft with on-board satellite communications. After a small discussion with stakeholders, it was decided to make the needed changes. Appendix C is now aligned with Amendment 90 except for GPS continuous wave interference which conforms to RTCA DO-316.

The PMC approved the document. It will be published as DO-368.

D. New Document – *Guidance for the Usage of Data Linked Forecast and Current Wind Information in Air Traffic Management (ATM) Operations, prepared by SC-206 (Aeronautical Information and Metrological Data Link Services)*

- Michael McPartland and Ernie Dash, SC-206 WG7 Co-Chairmen, presented at June 22nd meeting

Advances in aircraft equipment combined with satellite-based navigation and other supporting technologies provide the basis for more precise aircraft scheduling and spacing in Air Traffic

Management (ATM) operations. Based on the opportunity for more precise aircraft scheduling and spacing, new and upgraded ATM concepts are being developed and implemented. The objective of these new concepts is to increase airspace capacity and lower energy consumption and emissions while maintaining and promoting aviation safety.

The degree of accuracy of a predicted aircraft flight path relative to its actual flight path is based on many factors including the impact of the forecast and current winds and temperatures. The dynamic nature of the atmosphere, however, causes inaccuracies and uncertainty in the quality of wind and temperature information (both forecast and current) used in support of ATM operations. Without quality forecasts and current wind information, the precision in predicting flight path scheduling and spacing will be reduced and the achievable throughput in capacity-constrained airspace will be less than what could be attained. Therefore, newly developed Next Generation Air Transportation System tools and procedures would be less effective or even not used during periods of congested air traffic.

This document examines the impact of wind information on three ATM operations: wake mitigation, Required Time of Arrival (RTA), and Interval Management (IM); and provides guidance in the form of findings and recommendations on the use of wind information and related airspace procedure impacts based on previously and newly completed studies. The guidance covers the reporting and recommended quality of wind information determined necessary to support the three ATM operations. The findings and recommendations provide initial considerations for trade-offs and compromises by industry and the Federal Aviation Administration (and potentially other Air Navigation Service Providers) when developing the concepts and procedures for implementing (or upgrading) wake mitigation, RTA, and IM operations.

This document also provides an overview of and findings related to the use of current sources of wind information used by the aircraft and ground systems in supporting the three ATM operations. In addition, recommendations for future work are included to cover additional factors impacting the quality of wind and temperature information used in supporting these ATM operations as well as other operations not covered such as Dynamic Required Navigation Performance and Traffic Aware Strategic Aircrew Requests.

The PMC approved the document. It will be published as DO-369.

AGENDA ITEM 4 Integration and Coordination Committee (ICC)

No updates to report.

AGENDA ITEM 5 Action Item Review.

A. Forward Email Noting Calculation Error and Posted Changes to DO-253D - Status

- Karan Hofmann, PMC Secretary, presented

- The editorial error found was summarized and forwarded to PMC member on June 22nd. The update to DO-253D was posted on June 26th.

Action Closed.

B. Inform PMC members of any changes to Wind Data Guidance Document - Status

- Karan Hofmann, PMC Secretary, presented
 - PMC members were informed shortly after the SC-206 July 10th Plenary that there were no changes to the document as presented at the June 22nd meeting.

Action Closed.

C. Possibly Change December 13, 2017 PMC Meeting - Discussion

Discussed as part of Item 8. Action closed.

**AGENDA ITEM 6
Discussion.**

A. SC-159 – Navigation Equipment Using the Global Navigation Satellite System (GNSS) – Revised TOR - Discussion

Moved to Item 2B.

**AGENDA ITEM 7
Other Business.**

A. SC-206 – Aeronautical Information and Meteorological Data Link - Proposed TOR Revision - Discussion

- Allan Hart and Rocky Stone, SC-206 Co-Chairmen, and Eldridge Frazier, SC-206 DFO, presented at June 22nd meeting.

There were two proposed changes to the TOR. The first was presented originally at March 21st meeting to change MOPS to Guidelines document for Eddy Dissipation Rate Performance Algorithm Performance (better alignment with narrow scope of document and incongruity of fitting narrow scope document into MOPS drafting guide format).

The second is a delivery delay of Flight Information Services Broadcast (FIS-B) with Universal Access Transceiver updated MOPS to allow inclusion of additional defined weather products and ensure all SBS FIS-B system changes since the release of the original document are included.

The revised TOR was approved (RTCA Paper No. 188-17/PMC-1635)

B. SC-209 – ATCRBS/Mode S Transponder – ACSS Commitment to License (CtL) – Discussion

- Thomas Pagano, SC-209 Co-Chairman, presented

In their work revising DO-181E, *Minimum Operational Performance Standards for Air Traffic Control Radar Beacon System /Mode Select (ATCRBS/Mode S) Airborne Equipment*, and coordinating through the Combined Surveillance Committee and ICAO, it has been revealed some of the squitter modification technology information they wanted to include in the document has related patents. The initial work started at ICAO in 2008, including discussion with the patent owner, Aviation Communication & Surveillance Systems, LLC (ACSS). This was verbal but participants had the understanding any agreement would be aligned/similar to an ICAO - MIT LL Commitment to License (CtL). However, ICAO decided to let RTCA and EUROCAE work the standard, so the CtL requirement task moved. A CtL was just received by RTCA, but is not in alignment with the MIT LL sample nor the RTCA CtL outlined in the RTCA Policy for Proprietary References in RTCA Documents.

PMC members were concerned with the lateness in the process of bringing the CtL issue to their attention. Per the RTCA policy, the committee should discuss this matter with the PMC prior to proceeding with the inclusion of the technology in an RTCA standard. PMC members were also concerned with the potential impact on the document to adjust the CtL received to something acceptable.

PMC members recommended SC-209 stop efforts on any associated work with this technology (action) and to have RTCA approach ACSS with the MIT LL and RTCA policy sample formats, content, and conditions (action). Additionally, RTCA was tasked to review the current policy to remove any ambiguity and clarify the process timeline (action)

- The discussed CtL is posted on Workspace (RTCA Paper No. 162-17/PMC-1625).

AGENDA ITEM 8

Schedule for Committee Deliverables and Next Meeting Date

Documents expected for the September 2017 meeting:

- SC-213, Enhanced Flight Vision Systems/Synthetic Vision Systems
 - New Document – *MASPS for Synthetic Vision System for attitude awareness to address CAST SE 200*
- SC-224, Standards for Airport Security Access Control Systems
 - Revision to DO-230G – *Minimum Operational Performance Standards for Rechargeable Lithium Battery Systems*

Note: As reported at June 22nd meeting, this document will be delayed until December 2017 PMC meeting due to not being able to have Plenaries.

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

After much discussion concerning the actions taken by SC-225 to deal with the dissenting opinions, the PMC decided to ask the group to present the version of the document that includes the additional test developed to eliminate the dissensions, any new dissensions, and a committee response to the new dissensions. Discussion reasoning included:

- More than three companies indicated support for dissenting opinion (7 total per one of the formal submitted dissensions)
- A lot of effort was put into the alternate test for removal of dissention – PMC members want to see the test
- Inclusion of alternate test doesn't prevent companies from using original test
- Even with all test options, still matter of installation

To satisfy the Plenary requirements for such actions and due to the current processing time to get an agenda posted in the Federal Register, with the PMC DFO approval, the PMC decided to use the next PMC meeting (September 21st) as SC-225's Plenary to complete the actions (action).

- SC-228, Minimum Performance Standards for UAS
 - White Paper for Phase Two DAA MOPS
 - White Paper for Phase Two C2
- SC-233, Addressing Human Factors/Pilot Interface Issues for Avionics
 - New Document – *Addressing Human Factors/Pilot Interface Issues for Avionics*

Note: As reported at the June 22nd meeting, this document will be delayed until December 2017 PMC meeting due to not being able to have Plenaries.

- SC-235, Non-Rechargeable Lithium Batteries
 - Revision to DO-227 – *Minimum Operational Performance Standards for Lithium Batteries*

The dates for the next five PMC meetings were confirmed: Thursday, September 21, 2017; Tuesday, December 19, 2017 (Note: A change from previously announced); Thursday, March 22, 2018; and Thursday, June 21, 2018.

AGENDA ITEM 9

New Action Item Summary

See PMC Action Item Table.

/Signed/

Karan Hofmann, Secretary
RTCA Program Management Committee

CERTIFIED to be a true and accurate report of the meeting.

/Signed/

Christopher Hegarty, Chair
RTCA Program Management Committee

**Program Management Committee – July 13, 2017
ATTENDANCE LIST**

PMC MEMBERS:		
Christopher	Hegarty	The MITRE Corporation Chairman
Steve	Brown	National Business Aviation Association
Robert	Grove	Garmin Ltd.
Richard	Heinrich	Rockwell Collins, Inc.
Jens	Hennig	General Aviation Manufacturers Association
Steve	Hofmann	U.S. Air Force
Robert	Ireland	Airlines for America
Margaret	Jenny	RTCA, Inc
Randy	Kenagy	Air Line Pilot Association
George	Ligler	Project Management Enterprises Inc
Jessie	Turner	The Boeing Company
Lou	Volchansky	Federal Aviation Administration (Designated Federal Representative)

OTHER ATTENDEES:		
Clay	Barber	Garmin Ltd.
Allan	Hart	Honeywell International, Inc.
Karan	Hofmann	RTCA, Inc.
Victor	Iatsouk	Consultant
Sergey	Kaplev	Central Research Institute of Machine Building
Rebecca	Morrison	RTCA, Inc.
Barney	Owens	US Military
Thomas	Pagano	Federal Aviation Administration
Al	Secen	RTCA, Inc.
Oleg	Skubil	Design Bureau NAVIS

PMC ACTION ITEM TABLE

TRACKING NUMBER (Meeting Date and agenda item from which original action resulted)	ACTION	ACTION ASSIGNED TO	DUE DATE	STATUS
12/15/2016 Agenda Item 7A	12/15/2016 – Conduct PMC and ICC membership reviews 06/22/2017 – Discussion postponed until September PMC	RTCA Margaret Jenny FAA PB Members	Sep 2017	Open
03/21/2017 Agenda item 5E	03/21/2017 – NASA Security Presentation 06/22/2017 – Delayed until next meeting	PMC Steve Hofmann	Sep 2017	Open
03/21/2017 Agenda Item 7B	03/21/2017 – Define process/procedure for availability of RTCA documents as reference for selected EUROCAE WG’s 06/22/2017 – Still being worked	RTCA Al Secen	Sep 2017	Open
06/22/2017 Agenda Item 3A	06/22/2017 – Forward email noting calculation error and post corrected DO-253D to workspace 7/13/2017 – Email sent 06/22/2017	RTCA Karan Hofmann	June 2017	Closed
06/22/2017 Agenda Item 3D	06/22/2017 – Inform PMC members of any changes to Wind Data Usage Guidance Document per SC-206 July 10 th Plenary 07/13/2017 – No changes. Members informed 07/10/2017.	RTCA Karan Hofmann	July 2017	Closed
06/22/2017 Agenda Item 8	06/22/2017 – Possibly change December 13, 2017 meeting date 07/13/2017 – Changed December meeting to 19 th .	PMC	July 2017	Closed
07/13/2017 Agenda Item 7B	07/13/2017 – Direct SC-209 hold on any further work referencing ACSS IP Items	Al Secen	Sep 2017	Open
07/13/2017 Agenda Item 7B	07/13/2017 – Provide ACSS an example CtL with inputs from ICAO and MIT LL	Al Secen Tom Pagano	Sep 2017	Open
07/13/2017 Agenda Item 7B	07/13/2017 – Revisit RTCA IP Policy to remove ambiguity	RTCA Al Secen	Dec 2017	Open
07/13/2017 Agenda Item 8	07/13/2017 – Redirect SC-225 on version of DO-311A to present	SC-225	Sep 2017	Open

**RTCA PROGRAM MANAGEMENT COMMITTEE
MEETING SUMMARY
June 22, 2017**

The RTCA Program Management Committee (PMC) convened at 8:30 a.m. on June 22, 2017 at RTCA. The attendance list and action items are attached.

AGENDA ITEM 1

Welcome and Introductions

PMC Chairman Chris Hegarty welcomed the group, asked attendees to introduce themselves and to note their organization of affiliation. Lou Volchansky, the Designated Federal Official (DFO), read the Public Meeting Announcement that included statement that in accordance with the Federal Advisory Committee Act, this Advisory Committee meeting was supposed to be OPEN TO THE PUBLIC. However, notice of this meeting was not published in the Federal Register and thus this meeting is not recognized as a FACA meeting and thus no official items can be officially approved.

In attempt to not delay approval of items, the PMC members agreed to continue with discussions today and schedule an out-of-cycle virtual meeting for Thursday, July 13, 2017.

AGENDA ITEM 2

Review / Approve

C. The summary of the May 31, 2017 meeting was discussed. Any additional comments should be forwarded to PMC Secretary Karan Hofmann. Expect approval at the next PMC meeting (RTCA Paper No. 143-17/PMC-1618).

NOTE: Comment received to include the March 21st summary as part of the May 31st meeting, as not all items were re-discussed. Possibly add as attachment or addendum.

D. Administrative Special Committee Terms of Reference (TOR) Revision:

- SC-159 – Navigation Equipment Using the Global Navigation Satellite System (GNSS) – New Secretary and deletion of deliverables (provided approved under Items 3A, 3B, and 3C). No comment and expect TOR to be approved at next PMC meeting (RTCA Paper No. 164-17/PMC-1626).

AGENDA ITEM 3

Publication Consideration/Approval

E. Final Draft, Revision to DO-253C – *Minimum Operational Performance Standards for GPS Local Area Augmentation System Airborne Equipment*, prepared by SC-159 (Navigation Equipment Using the Global Navigation Satellite System (GNSS))

- Dr. George Ligler, SC-159 Co-Chairman, presented

RTCA/DO-253 defines the Minimum Operational Performance Standards (MOPS) for Global Navigation Satellite System (GNSS) airborne equipment augmented with the Local Area Augmentation System (LAAS). The LAAS has global application as a Ground-Based Augmentation System (GBAS) to GNSS.

RTCA/DO-253D supersedes RTCA/DO-253C. RTCA/DO-253D is complementary to the LAAS Interface Control Document (ICD) defined in RTCA/DO-246E. It is also complementary to the International Civil Aviation Organization Annex 10 Volume I GBAS standards and recommended practices (SARPs) for GBAS approach service types C (GAST C) and D (GAST D) as well as the differentially corrected positioning service (DCPS). This revision of DO-253 includes changes resulting from:

- The final validation of GAST D (which is a service capable of supporting approach and landing in Category III conditions) and the approval of Annex 10 with GAST D by ICAO, and
- Maintenance updates for the other GBAS services including GAST C (previously referred to as “Category I precision approach”) and DCPS.

Shortly after presentation, Dr. Ligler received an email indicating there was a calculation error in one spot in the document. Members requested for approval at next meeting that the email be forwarded email noting calculation error and post a corrected DO-253D to workspace (action).

Expect approval at the next PMC meeting for publication as DO-253D.

F. Revision to DO-246D – *GNSS-Based Precision Approach Local Area Augmentation System (LAAS) Signal-in-Space Interface Control Document (ICD)*, prepared by SC-159 (Navigation Equipment Using the Global Navigation Satellite System (GNSS))

- Dr. George Ligler, SC-159 Co-Chairman, presented

RTCA/DO-246 is the Interface Control Document (ICD) that defines the Signal-in-Space for the Global Navigation Satellite System (GNSS) augmented with the Local Area Augmentation System (LAAS). The LAAS has global application as a Ground-Based Augmentation System (GBAS) to GNSS.

RTCA/DO-246E supersedes RTCA/DO-246D, but the content of this ICD has been maintained to be backward compatible with all LAAS MOPS compliant equipment specified in RTCA/DO-253 as amended by applicable FAA Technical Standard Orders (TSOs).

RTCA/DO-246E is complementary to the LAAS MOPS avionics standard defined in RTCA/DO-253D. It is also complementary to the International Civil Aviation Organization Annex 10 Volume I GBAS standards and recommended practices (SARPs) for GBAS approach service types C (GAST C) and D (GAST D) as well as the differentially corrected positioning service (DCPS). This revision of DO-246 includes changes resulting from:

- The final validation of GAST D (which is a service capable of supporting approach and landing in Category III conditions) and the approval of Annex 10 with GAST D by ICAO, and
- Maintenance updates for the other GBAS services including GAST C (previously referred to as “Category I precision approach”) and DCPS.

Expect approval at the next PMC meeting for publication as DO-246E.

G. New Document – *Minimum Operational Performance Standards (MOPS) for GPS/GLONASS L1-only Airborne Equipment, prepared by SC-159 (Navigation Equipment Using the Global Navigation Satellite System (GNSS))*

- Dr. George Ligler, SC-159 Co-Chairman, presented

This document defines performance and testing requirements for a combined GPS/GLONASS receiver capable of using GPS and GLONASS L1 signals with Aircraft –Based Augmentation System. The document is primarily based upon RTCA document DO-316 "Minimum Operational Performance Standards for Global Positioning System /Aircraft-Based Augmentation System Airborne Equipment" and defines minimum performance for GPS/GLONASS sensors that provide position information to a multi-sensor system or separate navigation system to be used for enroute, terminal and non-precision approach (NPA) phases of flight. It also includes GPS/GLONASS antenna specifications using as a basis document RTCA DO-301 “Minimum Operational Performance Standards for Global Navigation Satellite System (GNSS) Airborne Active Antenna Equipment for the L1 Frequency Band”.

Expect approval at the next PMC meeting for publication with a yet to be designated DO number.

H. New Document – *Guidance for the Usage of Data Linked Forecast and Current Wind Information in Air Traffic Management (ATM) Operations, prepared by SC-206 (Aeronautical Information and Metrological Data Link Services)*

- Michael McPartland and Ernie Dash, SC-206 WG7 Co-Chairmen, will present.

Advances in aircraft equipment combined with satellite-based navigation and other supporting technologies provide the basis for more precise aircraft scheduling and spacing in Air Traffic Management (ATM) operations. Based on the opportunity for more precise aircraft scheduling and spacing, new and upgraded ATM concepts are being developed and implemented. The

objective of these new concepts is to increase airspace capacity and lower energy consumption and emissions while maintaining and promoting aviation safety.

The degree of accuracy of a predicted aircraft flight path relative to its actual flight path is based on many factors including the impact of the forecast and current winds and temperatures. The dynamic nature of the atmosphere, however, causes inaccuracies and uncertainty in the quality of wind and temperature information (both forecast and current) used in support of ATM operations. Without quality forecasts and current wind information, the precision in predicting flight path scheduling and spacing will be reduced and the achievable throughput in capacity-constrained airspace will be less than what could be attained. Therefore, newly developed Next Generation Air Transportation System tools and procedures would be less effective or even not used during periods of congested air traffic.

This document examines the impact of wind information on three ATM operations: wake mitigation, Required Time of Arrival (RTA), and Interval Management (IM); and provides guidance in the form of findings and recommendations on the use of wind information and related airspace procedure impacts based on previously and newly completed studies. The guidance covers the reporting and recommended quality of wind information determined necessary to support the three ATM operations. The findings and recommendations provide initial considerations for trade-offs and compromises by industry and the Federal Aviation Administration (and potentially other Air Navigation Service Providers) when developing the concepts and procedures for implementing (or upgrading) wake mitigation, RTA, and IM operations.

This document also provides an overview of and findings related to the use of current sources of wind information used by the aircraft and ground systems in supporting the three ATM operations. In addition, recommendations for future work are included to cover additional factors impacting the quality of wind and temperature information used in supporting these ATM operations as well as other operations not covered such as Dynamic Required Navigation Performance and Traffic Aware Strategic Aircrew Requests.

Note that this document has not been formally approved through an SC-206 Plenary due to the Federal Register posting issues. However, SC-206 will hold a Plenary on July 10th prior to the July 13th PMC meeting. PMC members asked if anything changes at that meeting to please bring it to their attention prior to the July 13th meeting (action).

Expect approval at the next PMC meeting for publication with a yet to be designated DO number.

I. Revision to DO-311 – *Minimum Operational Performance Standards for Rechargeable Lithium Battery Systems*, prepared by SC-225 (Rechargeable Lithium Battery and Battery Systems)

Document was not approved through Plenary for final release to the PMC. Expect this document to be presented to September 2017 PMC meeting.

- J.** Revision to DO-227 – *Minimum Operational Performance Standards for Lithium Batteries*, prepared by SC-235 (Non-Rechargeable Lithium Batteries)

Document was not approved through Plenary for final release to the PMC. Expect this document to be presented to September 2017 PMC meeting.

AGENDA ITEM 4

Integration and Coordination Committee (ICC)

No updates to report.

AGENDA ITEM 5

Action Item Review.

D. Recommended changes to MOPS/MASPS Drafting Guides – Update

- Karan Hofmann, PMC Secretary, presented

Background of action item:

- Action from December 2016 PMC Meeting to collect suggested changes to MOPS/MASPS/SPR Drafting Guide from Special Committees
- Call out sent January 12, 2017 to Chairmen and Secretaries
 - Sent to all committees except SC-236
 - Suspense set for March 31st
- Inputs to date: 10 separate individuals
 - SC-159, SC-206, SC-209, SC-228, Former PMC Member and RTCA Staff

SPR-MASPS Drafting Guide Major Suggested Changes:

- Document trying to do too many things – too confusing
- Separate SPR-INTEROP and MASPS guidance into separate Drafting Guides
- Some Areas of Clarification needed in Preface
- Clarify order of document development
- Mention of OSED – but confusing on how it fits in
- Annexes vs. Appendices – Clarify
- Synch up with Style Guide (formatting)
- Membership list (annex or last chapter in document)
- Spelling/Grammar Check throughout

MOPS Drafting Guide Major Suggested Changes:

- Spelling/Grammar Check throughout
- List of Figures/List of Tables in TOC
- Some acronyms need to be defined
- Synch up with Style Guide (formatting)
- Fix all broken cross-references
- Weakness identified going beyond current RTCA charter/mode of operation
- Include section for Manufacturer's Recommendations to maintain equipment performance

RTCA Staff now has task to incorporate these changes and finalized the drafting guides. Collection of inputs action closed.

- The briefing is posted on Workspace (RTCA Paper No. 152-17/PMC-1623)

E. NASA Security Presentation – Discussion

This presentation has been delayed due to current realignment of NASA and FAA activities. Expect at September 2017 PMC meeting.

F. Relook at WG-106 TOR - Discussion

- This action was closed at the May 31st PMC meeting.

G. EFB Possible CCC Action - Update

- Al Secen, RTCA Vice President, Aviation Technology and Standards, will present.

There is some industry interest in participating in WG-106, but no RTCA joint activity anticipated at this time. Discussion pointed out that European view/definition of EFB is quite different than U.S. and thus no current FAA requirements exist for the focus of EUROCAE's WG-106 EFB work. Action closed.

H. Availability of RTCA documents as reference for EUROCAE WGs – Discussion

- Al Secen, RTCA Vice President, Aviation Technology and Standards, will present.

Mr. Secen reported this is still being worked and coordinated with EUROCAE. Not all members of EUROCAE are members of RTCA. A member recommended a bi-lateral agreement so both agencies can technically protect ourselves and keep intellectual control. Action is still open.

I. Include Garmin's Admin recommendations to SC-214 TOR - Update

- Karan Hofmann, PMC Secretary, presented.

Recommended administrative changes were included in the SC-214 Revision 8 TOR. Action closed.

J. Provide summary of SC-214 TOR revision changes/increments - Update

- Karan Hofmann, PMC Secretary, presented.

The following summary of added/changed items was forwarded to PMC members on June 20th referencing the differences between the May 16th working group meeting and the March version

of the TOR:

- Kept EUROCAE WG-78 joint committee references and explanation of past work done with possible reinitiating as needed in background section
- Made EUROCAE WG-92 joint committee status better defined in background section
- Clarify connection to Link2000+ and ELSA consortium relation for VDL Mode 2
- Provided clarification of use of “connectionless” term
- Coordination with WG-92 deliverables – added an interim version of the MOPS (DO-281C) and the MASPS (DO-224E)
- Added a SC-214 vs. EUROCAE WG-92 publication schedule table
- Added special considerations referencing connectionless VDL2 operations

Action closed.

AGENDA ITEM 6

Discussion.

B. SC-159 – Navigation Equipment Using the Global Navigation Satellite System (GNSS) – Revised TOR - Discussion

Moved to Item 2B.

C. NextGen Advisory Committee (NAC) - Status Update

Since there has not been any DAC meetings since the last update, there will not be a presentation at this time.

D. Tactical Operations Committee (TOC) - Status Update

Since there has not been any TOC meetings since the last update, there will not be a presentation at this time.

E. Drone Advisory Committee (DAC) – Status Update

Since there has not been any DAC meetings since the last update, there will not be a presentation at this time.

F. FAA Actions Taken on Previously Published Documents – Report

- Lou Volchansky - PMC DFO presented (FAA Guidance based on RTCA Documents – RTCA Paper No. 149-17/PMC-1620)

FAA Published Documents that reference published RTCA Documents, FAA Pending Documents for RTCA Documents Published, and FAA plans for RTCA Documents pending PMC approval were reviewed.

FAA Published Guidance (Since Previous PMC)

RTCA Document	Developed By	FAA Guidance	Approval Date	Comment
Change 2 to DO-300 - Minimum Operational Performance Standards (MOPS) for Traffic Alert and Collision Avoidance System II (TCAS II) Hybrid Surveillance	SC-147	Note to manufacturers posted on RGL (rgl.faa.gov)	February 2017	DO-300 Change 2 can be used by manufacturers in support of their justification package for a TSO-C119d deviation.
DO-229E, MOPS for GPS/SBAS Airborne Equipment	SC-159	TSO-C145e TSO-C146e TSO-C204a TSO-C205a	5/5/2017 5/5/2017 5/9/2017 5/9/2017	Updates 4 TSO design standards accounting for increased satellite channels
DO-307A, Aircraft Design and Certification for PED Tolerance	SC-234	AC 20-164A	6/9/2017	Provides guidance on designing and demonstrating aircraft tolerance to PEDs

RTCA Published Documents - FAA Pending Guidance (through April 2017)

RTCA Document	Developed By	FAA Guidance	Planned Release Date	Comment
Change 1 to DO-300A; Change 2 to DO-300	SC-147	AC 20-151C	July 2017	Airworthiness installation guidance
C2 Data Link MOPS and V&V (Terrestrial)	SC-228	<u>New</u> TSO	December 2017	UAS C2 Equipment design standard

C2 Data Link MOPS and V&V (Terrestrial)	SC-228	AC 20-187	February 2018	Airworthiness installation guidance. (Delay from May 2017 to align with proposed TSO.)
DO-346, MOPS for Aeronautical Mobile Airport Communication System (AeroMACS)	SC-223	TSO-C207a	June 2017	Revise AeroMACS TSO to be used by ATS
DO-363, Guidance for the Development of Portable Electronic Devices (PED) Tolerance for Civil Aircraft	SC-234	AC 91-21.1D, Use of Portable Electronic Devices Aboard Aircraft	September 2017	Provides aircraft operators with guidance for compliance to Title 14 CFR part 91, section 91.21 Portable Electronic Devices
DO-262C, MOPS for Avionics Supporting Next Generation Satellite Systems	SC-222	TSO-C159d	TBD	Includes improvements to test cases for Iridium Next Short Burst Data testing
DO-343A MASPS for AMS(R)S Data and Voice Communications Supporting Required Communications Performance and Required Surveillance Performance	SC-222	None at this time	N/A	Includes Swift Broad Band ground gateway-to-aircraft VPN tunneling. Needed for engineering/ scoping purposes
DO-365, Detect and Avoid MOPS Phase I	SC-228	TSO-C212	September 2017	Design standard
		AC	January 2018	Airworthiness installation of a UAS DAA system

DO-366, Air-to-Air Radar Detect and Avoid MOPS Phase I	SC-228	TSO-C211	September 2017	Design standard
DO-367, MOPS for Terrain Awareness and Warning System (TAWS)	SC-231	TSO-C151d	August 2017	Updates TSO design standard (new MOPS documentation)

RTCA Documents Pending PMC Approval

RTCA Document	Developed By	Planned FAA Guidance	Planned Release Date	Comment
DO-XYZ, MOPS for GPS/GLONASS (FDMA + Antenna) L1-only Airborne Equipment	SC-159	Under review	—	—
DO-246E, GNSS-Based Precision Approach Local Area Augmentation System Signal-in-Space Interface Control Document	SC-159	None	—	This document is a reference for DO-253D. It is published by RTCA for the convenience of avionics OEMs.
DO-253D, MOPS for GPS Local Area Augmentation System Airborne Equipment	SC-159	New TSOs and/or modifications to TSO-C161 and TSO-C162	January 2018	New design standard to support Category II/III operations; maintenance updates to legacy standards

G. Special Committees – Chairmen’s Reports and Active Inter-Special Committee Requirements Agreements (ISRA) - Review

- Rebecca Morrison, RTCA Program Director, reported

Highlights from the Chair Reports for several selected Special Committees were reviewed. Reports were received from SCs 135, 223, 228, 233, and 235. Other information was included in other presentations during this PMC meeting.

There are three ISRA’s active at the current time:

- SC-206-ISRA-186-01 – Coordination with Combined Surveillance Committee SC
- SC-206-ISRA-209-01 – Coordination with Combined Surveillance Committee SC
- SC-186/003 (5) – FIMS-S Datalink Standards

There are three ISRA’s from SC-228 “in the works” for SC-135, SC-222, and SC-223.

The complete matrix and individual committee reports are posted on Workspace (RTCA Paper No. 150-17/PMC-1621).

H. European/EUROCAE Coordination – Status Update

- Rebecca Morrison, RTCA Program Director, reported

EUROCAE Topics of Note:

- New Documents Released by EUROCAE since last PMC – still awaiting joint publication of documents approved at May 31st PMC
 - o DO-262C/ED-243 – Minimum Operational Performance Standards for Avionics Supporting Next Generation Satellite Systems (NGSS). Expected publication June 2017
 - o DO-343B/ED-242 – Minimum Aviation System Performance Standard for AMS(R)S Data and Voice Communications Supporting Required Communications Performance (RCP) and Required Surveillance Performance (RSP). Expected publication June 2017
 - o DO-366/ED-XYZ – Feasibility Study Weather Radar for Ice Crystal Detection. Expected publication Fall 2017.
- Coordination Activities:
 - o A list of Technically Equivalent Documents
 - Requested by EASA, RTCA/EUROCAE are working comprehensive list of technically equivalent documents
- New Working Group
 - o WG-106: Electronic Flight Bag (EFB) (proposed as joint)
 - As mentioned under items 5C and 5D, no RTCA committee anticipated for this subject
 - o New WG on RNP revision based on DME/DME (proposed as joint)
 - EASA supports, but not sure of impact

- PMC members recommend SC-227 monitor activities vs. setting up a new committee
- TAC Meetings in 2017:
 - TAC#69: 29 – 30 August 2017, Paris, EUROCAE
 - TAC#70: 17 – 18 October 2017, Toulouse, DSNA

International Civil Aviation Organization (ICAO) Update:

- RPASP 8 scheduled for June of 2017
 - Al Secen attending
 - Pulling together final documents for August review submission
 - Provided working papers from SC-228 for additional information – well received
- RPASP 9 plenary planned for November
 - Final coordination with/endorsement by other expert groups by Aug 2017 (for the candidate SARPS)
 - Final drafts presented

The RTCA staff will continue to keep the PMC apprised of developments.

AGENDA ITEM 7

Other Business.

C. SC-206 – Aeronautical Information and Meteorological Data Link - Proposed TOR Revision - Discussion

- Allan Hart and Rocky Stone, SC-206 Co-Chairmen, and Eldridge Frazier, SC-206 DFO, presented.

SC-206 Leadership presented two proposed changes to the TOR. The first was presented originally at the March 21st meeting to change MOPS to Guidelines document for Eddy Dissipation Rate Performance Algorithm Performance (better alignment with narrow scope of document and incongruity of fitting narrow scope document into MOPS drafting guide format).

The second is a delivery delay of Flight Information Services Broadcast (FIS-B) with Universal Access Transceiver updated MOPS to allow inclusion of additional defined weather products and ensure all SBS FIS-B system changes since the release of the original document are included. PMC members expressed concern of the delay until March 2019 for publication.

There was also some discussion on data authoritative source vs. sole source.

Expect TOR to be approved at next PMC meeting.

- The revised TOR and briefing are posted on Workspace (RTCA Paper No. 142-17/PMC-1617).

D. SC-209 – ATCRBS/Mode S Transponder – ACSS Commitment to License (CtL) – Discussion

- Due to a scheduling conflict, Thomas Pagano, SC-209 Co-Chairmen, will present at the July Plenary meeting.
- The CtL is posted on Workspace (RTCA Paper No. 162-17/PMC-1625).

E. SC-225 – Rechargeable Lithium Batteries and Battery Systems – Discussion – Status Update on DO-311 Revision and Revised TOR

- Richard Nguyen (SC-225 Chairman), Stephen Diehl (SC-225 Secretary), and Norman Pereira (SC-225 DFO), presented

SC-225 leadership provided an update on SC-225 status. They are working through dissenting opinion with two teams – one drafted a response to the dissenting opinions and one drafted an Appendix C for adoption into DO-311A to satisfy dissenting opinion concerns. The proposed Appendix will be presented to full membership at the July 11th Plenary. Indications are dissenting opinions will be withdrawn if Appendix C is adopted. However, at least 3 companies have indicated opposition to the addition and may input their own dissenting opinions.

After much discussion, the PMC members still felt the best solution was within the committee vs. setting up a separate Ad Hoc to resolve this matter. This PMC intervention would further delay the publication of this much-needed document (required to close out an NTSB recommendation).

The final version of DO-311A was forwarded to SC-225 Ad Hoc members for review. There was concern on testing in support of 2 Wh limit. The FAA Tech Center ordered cells from 3 different manufactures for thermal runaway testing. Testing was completed on two cell sets with the third set arriving this week. Test results/report will be written by the end of June for presentation to the Ad Hoc committee.

AGENDA ITEM 8

Schedule for Committee Deliverables and Next Meeting Date

Documents expected for the September 2017 meeting:

- SC-213, Enhanced Flight Vision Systems/Synthetic Vision Systems
 - New Document – *MASPS for Synthetic Vision System for attitude awareness to address CAST SE 200*
- SC-224, Standards for Airport Security Access Control Systems
 - Revision to DO-230G – *Minimum Operational Performance Standards for Rechargeable Lithium Battery Systems*

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

- SC-225, Rechargeable Lithium Battery and Battery Systems
 - Revision to DO-311 – *Minimum Operational Performance Standards for Rechargeable Lithium Battery Systems*
- SC-228, Minimum Performance Standards for UAS
 - White Paper for Phase Two DAA MOPS
 - White Paper for Phase Two C2
- SC-233, Addressing Human Factors/Pilot Interface Issues for Avionics
 - New Document – *Addressing Human Factors/Pilot Interface Issues for Avionics*

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

- SC-235, Non-Rechargeable Lithium Batteries
 - Revision to DO-227 – *Minimum Operational Performance Standards for Lithium Batteries*

The dates for the next five PMC meetings were confirmed: Thursday, July 13, 2017; Thursday, September 21, 2017; Wednesday, December 13, 2017; Thursday, March 22, 2018; and Thursday, June 21, 2018. There is an ICAO meeting now scheduled for the week of December 11-15, 2017 conflicting with our meeting. PMC members agreed to relook at that date at the July 13th meeting (action).

Member requested an agenda item be added to future meetings to allow for a CCC update, like the current ICC update. If there is nothing to report, so be it.

AGENDA ITEM 9
New Action Item Summary

See PMC Action Item Table.

/Signed/
Karan Hofmann, Secretary
RTCA Program Management Committee

CERTIFIED to be a true and accurate report of the meeting.

/Signed/
Christopher Hegarty, Chair
RTCA Program Management Committee

**Program Management Committee – June 22, 2017
ATTENDANCE LIST**

PMC MEMBERS:		
Christopher	Hegarty	The MITRE Corporation Chairman
Steve	Brown	National Business Aviation Association
Robert	Grove	Garmin Ltd.
Richard	Heinrich	Rockwell Collins, Inc.
Jens	Hennig	General Aviation Manufacturers Association
Steve	Hofmann	U.S. Air Force
Robert	Ireland	Airlines for America
George	Ligler	Project Management Enterprises Inc
Jessie	Turner	The Boeing Company
Lou	Volchansky	Federal Aviation Administration (Designated Federal Representative)

OTHER ATTENDEES:		
Clay	Barber	Garmin Ltd.
Alex	Bolkunov	Central Research Institute of Machine Building
Ernie	Dash	Av Wx
Stephen	Diehl	The Boeing Company (ret)
Eldridge	Frazier	Federal Aviation Administration
Alina	George	RTCA, Inc
Yan	Glina	MIT LL
Christophe	Hamel	L-3
Allan	Hart	Honeywell International, Inc.
Karan	Hofmann	RTCA, Inc.
Sergey	Kaplev	Central Research Institute of Machine Building
Vadimir	Korchagin	R&D Institute Aeronavigation
Michael	McPartland	MIT LL
Rebecca	Morrison	RTCA, Inc.
Richard	Nguyen	The Boeing Company
Norman	Pereira	Federal Aviation Administration
Al	Secen	RTCA, Inc.
Oleg	Scubiy	Design Bureau NAVIS
Sergey	Silin	Design Bureau NAVIS
Sandra	Schmidt	Federal Aviation Administration
Rocky	Stone	United Airlines
Ron	Stroup	Federal Aviation Administration

PMC ACTION ITEM TABLE

TRACKING NUMBER (Meeting Date and agenda item from which original action resulted)	ACTION	ACTION ASSIGNED TO	DUE DATE	STATUS
12/15/2016 Agenda Item 4A	12/15/2016 – Solicit recommended comments on MOPS/MASPS/SPR Drafting Guides 06/22/2017 – Summary briefed – follow on RTCA staff task	RTCA Karan Hofmann	Jun 2017	Closed
12/15/2016 Agenda Item 7A	12/15/2016 – Conduct PMC and ICC membership reviews 06/22/2017 – Discussion postponed until September PMC	RTCA Margaret Jenny FAA PB Members	Sep 2017	Open
03/21/2017 Agenda item 5E	03/21/2017 – NASA Security Presentation 06/22/2017 – Delayed until next meeting	PMC Steve Hofmann	Sep 2017	Open
03/21/2017 Agenda Item 6J	03/21/2017 – Look at EFB (WG-106) as possible CCC action 06/22/2017 – Agreed no further action for now at RTCA	RTCA Margaret Jenny	Jun 2017	Closed
03/21/2017 Agenda Item 7B	03/21/2017 – Define process/procedure for availability of RTCA documents as reference for selected EUROCAE WG’s 06/22/2017 – Still being worked	RTCA Al Secen	Sep 2017	Open
05/31/2017 Agenda Item 6A	05/31/2017 – Include Garmin’s Admin recommendations to SC-214 TOR 06/22/2017 – Action Accomplished	RTCA Karan Hofmann	May 2017	Closed
05/31/2017 Agenda Item 6A	05/31/2017 – Provide summary of SC-214 TOR revision changes/increments 06/22/2017 – Action Accomplished	RTCA Karan Hofmann	May 2017	Closed
06/22/2017 Agenda Item 3A	06/22/2017 – Forward email noting calculation error and post corrected DO-253D to workspace	RTCA Karan Hofmann	June 2017	Open
06/22/2017 Agenda Item 3D	06/22/2017 – Inform PMC members of any changes to Wind Data Usage Guidance Document per SC-206 July 10 th Plenary	RTCA Karan Hofmann	July 2017	Open
06/22/2017 Agenda Item 8	06/22/2017 – Possibly change December 13, 2017 meeting date	PMC	July 2017	Open