

Minutes of 26th Meeting
RTCA Special Committee 227
18th Meeting
EUROCAE WG-85
16-18 February 2021
Virtual

Agenda

Tuesday

1. Welcome and Administrative Remarks
2. Introduction
3. Review and approve minutes from November 2020 meeting
4. Agenda Overview
 - a. Opening Plenary – Day 1
 - b. Working Group 1 – Day 2 and 3
 - c. Closing Plenary – Day 3
5. Review WG-1 Approved Change Proposals
 - a. M1-07b TSE Terminology Clarification
 - b. M2-03. RNP Hold Entry Visual Cues

6. Review Status of WG-1
7. Review Status of WG-3
8. New Change Proposal Assignments

Wednesday

1. WG-1 Change Proposal Development

Thursday

1. WG-1 continued
2. Closing Plenary
 - a. Other Business
 - i. Approve SC-227 TOR Working Changes for WG-3
 - b. Review Action Items
3. Adjourn

Chairman: Mike Cramer, MITRE
GAR: Barry Miller, FAA
Secretary: Dave Nakamura, MITRE
Program Director: Rebecca Morrison
EUROCAE TPM: Alex Engel
WG-85: Okuary Osechas, DLR

Attendees

Name	Company/Organization
Aaron Jacobson	Boeing
Adam See	Delta
Alex Capodicasa	CMC
Alex Engel	EUROCAE
Andrew McKenzie	Nav Canada
Andrew Riedel	Boeing
Barry Miller	FAA
Tiziano Bernard	Garmin
Bill Forstie	Honeywell
Bill Tuccio	Garmin
Bob Gaul	Garmin
Brad Miller	FAA
Christine Clausnitzer	FAA
Christopher Adams	EUROCONTROL
Dale Courtney	FAA
Dave Lewin	NATS
David Jordan	UASC
David DeSmedt	EUROCONTROL
Doug Phifer	FAA
Erik Ringnes	Honeywell
Fernando Diaz	ENAIRE
Florian Buchmann	Austro Control
Frank Wigold	Lufthansa Systems
Gang Feng	Boeing
Gary McMullin	Southwest Airlines
Gary Petty	FAA
Grant Clow	PSA Airlines
Greg Comstock	StratMach
Guy Decker	Thales
Jeff Kerr	FAA
Jeff Meyers	FAA
Joel Dickinson	FAA
John Barry	FAA
Kendal Hershberger	Garmin
Kevin Sivits	Leonardo/Selex
Kirk Kolek	Collins Aerospace
Kurt Stiefel	FAA
Mike Cramer	MITRE
Mike Jackson	Honeywell
Mitch Narins	FAA
Monica Vafiades	USAF
Dave Nakamura	MITRE
Nico De Gelder	NLR
Nick Tallman	FAA

Rebecca Morrison
Ricardo De Sousa
Russ Ramaker
Ruth Hirt
Shivathsan Narayanan
Stephen Moody
Steve Horvath
Stuart Bowman
Tim Geels
Tim Padden
Tom Yochum
Valeriu Vitan
Victor Gordo
Wes Googe

RTCA
NATS
GE
FAA
DLR
Boeing
Garmin
MITRE
Collins
USAF
Boeing
EUROCONTROL
Ineco
American Airlines

Tuesday, February 16

Mike reviewed the agenda.

Welcome and Administrative Remarks

Mike Cramer opened the plenary Webex session at 9:00 AM, Tuesday, February 16th. Mike welcomed the participants. Rebecca reviewed both the RTCA and EUROCAE Anti-Trust, Proprietary, and Committee Membership Participation policies. Due to the fact this was a virtual meeting, the typical individual introductions were not made. Members were reminded to note on workspace meeting attendance.

Review and Approve minutes

Dave walked through the minutes for the last meeting. They were approved.

Schedule

The committee schedule was reviewed. The early 2022 completion could be earlier depending on the amount of change to come.

Change Proposal Review

The following WG-1 Approved Change Proposals were reviewed.

M1-07b TSE Terminology Clarification

This change proposal provides updates that clarify and better align the TSE terminology with that used in other PBN standards and guidance material. Accepted by plenary

M2-03. RNP Hold Entry Visual Cues

This change proposal adds a recommendation to provide visual cues for the fly-by entry into the hold, as an improvement in operational awareness of system performance. Accepted by plenary

Review Status of WG-1

Dave reviewed the current list of issues and action and their status. He noted that with the few remaining papers in hand, the working group may complete them before the next plenary. The remaining open issues have not resulted in any change proposals. The committee may need to consider setting them aside as items for the committee parking lot until which time a change proposal is submitted

Review Status of WG-3

Andrew indicated that Working Group 3 just kicked off work in December. Discussions so far have been to review the TORs, schedule. The TORs were revised to clarify the relationship of DDC with paper charts that will be discussed at plenary. The possible contents for DO-257C were reviewed. The WG meeting minutes will be posted to the workspace.

New Change Proposal Assignments

No new change proposals were discussed. The open issues and actions were reviewed. A number of unworked items were assigned to the 227 Parking Lot. This means that no action will be taken until a change proposal is submitted, which must be before the conclusion of the current work items. Some were withdrawn. Others were taken on by members of the committee as noted on the Issues/Action Item list.

Wednesday, February 17th, Working Group 1

WG 1 Change Proposal Development

FIM/TOAC

This presentation provided an overview and background with regard to TBM operations including TOAC/RTA and IM. One key point is that based upon the technical work and simulations for IM in SC-186 Flight Deck IM is probably more appropriate in select higher density operations to achieve greater operating efficiency and increased traffic flow. The information indicates that the greatest value of TOAC/RTA is in cruise up to operational transition into the terminal area. IM becomes a bigger factor in the terminal area because of higher traffic density and operational complexity. The proposed MASPS change to have a priority on time with a 10% speed adjustment envelope leads to consistency and compatibility with IM aircraft. The speed profile for IM operations is key aspect of the predictability of IM.

The proposed MASPS changes to increase the speed adjustment envelope for certain speed restriction from 5 knots to 10 percent when there is a active time requirement is a concern. The concerns for SC-227 include:

1. Acknowledge and accept change impact to the thousands of aircraft that already have TOAC capability compliant with DO-236B/ED-75B and those which have begun the updates for DO-236C Change 1 and ED-75D. While there may be an argument that such capability has little utility until changes are made, this leads to the next concern.
2. The suggested change introduces a different aircraft behavior with regard to a speed adjustment envelope that is in effect and when. As the change proposal stands at this time, both the 5 knot and 10% envelopes would exist. 5 knots when there is a speed restriction and no time requirement vs 10% for certain speed restriction when there is a time requirement. How this is communicated to the flight crew for awareness has not yet been addressed.
3. The adoption of the 10% speed adjustment envelope also adds another issue to be addressed. The operator fleets must be operated and behave in a consistent manner when aircraft system upgrade is being implemented. In the past, this has meant that the old operational behavior e.g. 5 knots is retained across old and newly upgraded systems until the target fleet has all been updated, at which time a fleet switchover takes place. This means the MASPS must provide some guidance about this e.g. consideration of a software option to turn on/off the software change.

One point raised is that what is coming from SC-186 is based upon a lot of study, analyses and review, where SC-227 has little foundational material to determine how to address implementation and operational effects for changes to both the TOAC and baseline functional and performance requirements. Perhaps, SC-227 needs a TOAC study to have data vs notion and best guess driving change

Part of the FAA's problem in helping to guide the SC-227 MASPS is that there is little experience with TOAC compliant systems. There are no TOAC approvals per the AC and TSO. There has been little US investigation of aircraft on what makes TOAC/FIM work from a systems/operator/implementation standpoint. Also, the FAA is somewhat unsure of TOAC is and how it can be used re: operational approval. What can be achieved with TOAC and how beneficial it is in the operations is not clear. It was noted that there is no FIM rule, the concept is that there will be operational benefits if equipped. FIM has no reliance on TOAC. IM plans not affected are not affected if TOAC changes or not. More work is needed to show the maturity of TOAC since maturity is one issue against it. The supplier perspective is that they are hesitant to build to immature standards. Perhaps the only solution is to add an informational note about TOAC and the need for further work and study including the 10% speed adjustment envelope and the amount of speed control when not in TOAC. This could lead to another Change 1 or 2 for updated TOAC.

M1-11, Lateral Turn Performance

To recap, this started out as an effort to further optimize/reduce airspace volumes for the RNP fly-by transition. One option was the latest proposal from 2013 which changed from describing a transition area to

standardizing the turn of aircraft. Another option was to revise the original area description by reducing the max groundspeed assumptions for the turn. The last was to leave as it.

Where we are now is with the latest version that revises the MASPS requirements to change from a low and high altitude level for lateral turn description to standards for turns with low, mid and high altitude splits. Additionally, the max bank angle is limited to 23 degrees or and still allows for what is best for the aircraft. This is because depending on aircraft, speed and turn capability, banking to 23 degrees is not necessary or appropriate to achieve a fly by turn that fits within a reasonable transition area. To ensure that the area does not become excessive, turn initiation distances are also associated with the two levels. For the high altitude transition, the bank angle is influenced by the limit on turn initiation distance. The revised requirements are compatible with a majority of aircraft, and should not have a significant impact. It was suggested that the group agree to a modification for just low and high altitudes. The group agreed with the simplified solution and the update will be presented at plenary.

Thursday, February 18th

WG1 Change Proposal Discussion - continued

M1-12a Direct-to function and User Defined Course to a Fix

This paper proposes to expand the direct-to functional requirement to include the functional option of being able to specify a intercept course to a fix instead. This is due to experience with RNP approaches and ATC needs for vectoring to parts of the procedure. It was noted that this was an original proposal when the MASPS was developed but not included because of the RNP conops where reliable, repeatable and predictable procedure paths are to be used. Instead the separate user defined course to fix requirement was made. This resulted in requirements better aligned with GNSS navigator capabilities that were more limited. The current MASPS allows for implementation choices, e.g. where direct to intercept was more convenient as with many existing systems or a separate intercept function was provided. This was also felt to be the minimum requirement given the move to RNP operations and procedures were intended to remove the need for vectoring operations. It was noted that intercepts were not considered part of RNP operations. However, experience to date is that ATC vectoring is being used for RNP operations. Additionally, the user workload to implement intercepts are varied and could take a lot of heads down actions at a time where it's not desirable. It was noted that ARINC 702 as the tech standard followed by airlines has the combined direct-to/intercept feature. Regarding the proposed text, deletion of waypoints is not desirable. Concerns were raised about unintended consequences for VTF course extensions and associated operations. Proper design is needed. Consider not discussing VTF in the text. Work will continue at the next WG1 session.

Plenary resumes

M1-11, Lateral Turn Performance

Erik reviewed the proposed change accepted at yesterday's working group meeting. The discussion raised a number of issues including are the min bank angles what we really want/need, a need for less liberal standards, a means to better use airspace, provide a forward looking standard, not having a turn initiation standard that will be misinterpreted vs the intention to have designs where the track change, speed, bank, aircraft capability, and altitude sensitivity determine turn initiation. The change proposal is going back to WG 1 for more discussion and updates.

WG3 reviewed proposed changes to their TORs to clarify their tasking and more specifically what standards they will develop. Plenary accepted. It will go forward to the PMC.

New Business

There was no new business. It was noted that RTCA Workspace is moving. They will be porting all existing documents on workspace. The current application is not being maintained leading to the need to make this change.

Everyone was reminded to check attendance on the workspace.

Webex Meeting Adjourned