MEETING MINUTES OF THE THIRTY-FIRST MEETING JOINT RTCA SPECIAL COMMITTEE 217 EUROCAE WORKING GROUP 44

27th November through 1st of December 2017, Phoenix, Arizona, USA - Hosted by Honeywell Aerospace

Executive Summary

RTCA SC-217 met jointly with EUROCAE WG-44 at Honeywell in Phoenix, Arizona, USA from the 27th November through the 1st of December 2017. The main objective of the meeting was to continue the revision of RTCA DO-201A/EUROCAE ED-77.

A working group session was held on the 27th and 28th of November aimed at progressing the work on the Data Quality Requirements and data catalogue for Aerodromes, Instrument Flight Procedures, and Routes.

On the 29th of November, in opening plenary, the group addressed organizational items, approved the minutes from the 30th meeting, approved the agenda for the 31st meeting, and reviewed the status of the action items and the overall progress of the work on the draft document.

During the subsequent working group session, submitted papers were reviewed on the following topics:

- Rules for navigation data preparation the group reviewed the text implementing the changes agreed at the Paris meeting, and agreed that the final version be integrated in the master document.
- Appendix I the group reviewed the revised draft appendix and made changes online. The group decided to update the presentation of the references, e.g. to remove the postal addresses from which publications can be obtained. It was decided to include references to relevant FAA and EASA publications. This content will move into Section 1 of the document.
- Use of 'Critical' integrity parameter by an application requiring 'Essential' the group reviewed the proposed paper and agreed to the inclusion of the revised text in the master document.
- Procedure encoding The group made a review and introduced changes during the discussion. It was decided to replace Figures 3-21 through 3-36 by compiling a list of new examples of positive and negative practices related to coding of procedures. The goal is to identify current issues and best practices related to procedure design and illustrate them in the document.
- Consideration of State-provided procedure coding the group reviewed the proposed text, made changes online and agreed the revised text is ready to be included in the master document.

The group also discussed the subject of Data-Driven Charting (DDC), in particular, whether it needs to be covered in the updated document. If it is decided not to cover DDC, an option would be to start the development of a new standard, dedicated only to DDC. However, this may lead to overlap. FAA has already done a classification of data elements as DDC and the group has identified the data elements relevant to DDC - around 120 data elements. An action was assigned to FAA to prepare elements for Group decision at the next meeting.

In closing plenary, the document update status was reviewed, in particular, the progress on the various sections and appendences of the document, and respective actions were confirmed.

The group looked at two options proposed by the Co-chairs in accordance with the contingency plan¹ introduced at the previous meeting to address a potential need for delay in the delivery of the document to RTCA/EUROCAE:

- <u>Plan A</u> – no change to schedule: document ready for Final Review and Comments (FRAC) after the meeting in Brussels and FRAC resolution in June 2018. The feasibility of this plan depends on the

^{- &}lt;sup>1</sup> If the Document is delivered to EUROCAE/RTCA prior to the 10th of November 2018 – no particular procedure will be needed. If delivered after the 10th of November 2018 - a formal approval by RTCA PMC will be required no later than September 2018.

- decision to be taken on whether to cover DDC or not. If it is decided to be covered, this will likely make Plan A unfeasible to meet the original schedule.
- <u>Plan B</u> to have one additional meeting in October 2018 in Europe (possible locations Frankfurt or Zurich) for FRAC resolution; delivery of the document no later than 10 November 2018, so that there is no need for a formal approval from PMC.

The meeting objectives were achieved. Good overall progress was made. The next meeting will take place from the 26^{th} of February through the 2^{nd} of March 2018 in Brussels, Belgium, hosted by EUROCONTROL.

1 Working Group session

1.1 Introduction

RTCA SC-217 met jointly with EUROCAE WG-44 at Honeywell in Phoenix, Arizona, USA from the 27th November through the 1st of December 2017. The main objective of the meeting was to continue the revision of DO-201A/ED-77.

A working group session was held on the 27th and 28th of November aimed at progressing the work on the Data Quality Requirements and data catalogue for Aerodromes, Instrument Flight Procedures, and Routes.

Brian Gilbert opened the session. Attendees introduced themselves. Brian Gilbert introduced the organization of the work during the week.

1.2 Attendance List

Name	Company/Organization	Email address
Reuss Anderson	Garmin	reuss.anderson@garmin.com
David Baker	MITRE	dbaker@mitre.org
Kevin Carey*	US Air Force	kevin.carey.1@us.af.mil
Matthew Colburn*	Boeing	matthew.j.colburn@boeing.com
Torsten Domroes	Jeppesen	torsten.domroes@jeppesen.com
Stéphane Dubet	DGAC / DSNA / SIA	Stéphane.dubet@aviation-civile.gouv.fr
Greg Fisher	Universal Avionics Systems	gfisher@uasc.com
Brian Gilbert	Boeing	brian.d.gilbert@boeing.com
Karan Hoffman*	RTCA	khoffman@rtca.org
Thomas Koebel	Airbus	thomas.koebel@airbus.com
Daniel Madore	Honeywell	daniel.madore@honeywell.com
Sergiu Marzac*	EUROCAE	sergiu.marzac@eurocae.net
Jeff Meyers	FAA	jeffrey.meyers@faa.gov
Brad Miller	FAA	brad.miller@faa.gov
Stephen Moody	Jeppesen	stephen.moody@jeppesen.com
Rebecca Morrison*	RTCA	morrison@rtca.org
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Collin Ogden	Rockwell Collins	collin.ogden@rockwellcollins.com
Jeff Plantinga	GE Aviation Systems	jeffrey.plantinga@ge.com
Lee Powers	Honeywell	lee.powers@honeywell.com
Erik Ringnes	Honeywell	erik.ringnes@honeywell.com
Scott Roesch	Honeywell	scott.roesch@honeywell.com
Michael Sauter	Lufthansa Systems	michael.sauter@lhsystems.com
Jim Terpstra	Consultant	jim_terpstra@msn.com

^{*} Participation via WebEx

1.3 Data Quality Requirements (DQR) actions/topics

The group continued the work on the Data Quality Requirements (DQR) tables and data catalogue for three of the data categories - Aerodromes, Instrument Flight Procedures and Routes - addressing actions and topics that have been progressed by the DQR sub-team during the WebEx meetings. The main topics and activities covered were:

Instrument Flight Procedure (IFP) data catalogue and table

Reuss presented the progress made during the WebEx meetings and the points on which there was a need to discuss in Plenary.

- o PBN requirements
 - Navigation Specification, Sensor Limitations and Functional Requirements the group decided to keep integrity requirement Routine for all three of them.
- Procedure segment
 - MOCA it was agreed to set the integrity requirement to 'Routine'.
 - True Bearing and Magnetic Bearing The wording of the definitions was revised. It was decided to keep two separate elements True and Magnetic and for both of them to set the integrity requirement to "Essential".
 - Gradient It was decided to set the integrity requirement to 'Routine'.
 - Threshold Crossing Height (TCH) It was discussed if IFP was the right place for TCH, or it would rather be better placed in Aerodromes. The various uses of TCH were discussed, i.e. procedure design and vertical guidance. I was decided to keep the element in the IFP section and set the integrity requirement to 'Essential'.
 - Speed It was decided to set the integrity requirement to 'Routine'.
- Final approach segment (FAS)
 - It was decided to link the FAS with the Data Block the title was changed to Final Approach Segment Data Block (FAS DB). It was noted that the requirements on FAS DB are published in RTCA DO-229, Appendix D. It was decided to refer to DO-229 in DO-201B, including for the definitions of the data elements and the data quality requirements. Matt asked if it would be possible to change the content of the FAS, e.g. add front course. Stéphane replied that in principle it would be possible but in practice it would be very difficult to do this as the FAS DB content has been agreed following extensive discussions. Matt was of the view that there were missing data elements from the outset. Jeff M. explained that this type of requirement is at system level and the right group to address it is RTCA SC-159, not SC-217/WG-44, as database requirements are not the appropriate driver for the system requirements. It was agreed that changing FAS DB content is not something that should be within the scope of SC-217/WG-44. In conclusion, Stéphane proposed to reference DO-229 but to still keep the DQR values in DO-201B.
 - Thomas questioned what the added value was of individually defining the FAS DB data elements, having in mind that the totality of the FAS DB content will be 'Critical' integrity because it is in the FAS DB. On the other hand if the same data element is outside of the FAS DB it may be 'Essential'. This is because the integrity requirement will depend on the application that will use the data elements. In other words, in different operational contexts, a given data element may have different data quality requirements depending on the application. It was decided to group all data elements contained in the FAS DB in one field with integrity requirement Critical, since individual data elements needed by other

applications are available in other areas of the data catalogue. The CRC Remainder and the SBAS Channel Number data items were listed as separate data elements with integrity requirement Routine. Definition and Reference for CRC Remainder and SBAS Channel Number were added.

A discussion took place on accuracy & resolution of declared values. It was recalled that a special indicator – superscript DV after the value – is used to identify which data elements are declared values. Data elements that may have a known means of derivation in some cases, and be declared or unmeasurable in other cases, will continue to be denoted by an asterisk after the value, indicating that the accuracy value applies when it can be determined. Some reservations were expressed by members of the group as the use of an asterisk could be open to interpretation and potentially lead to long discussions and increased workload during implementation. Reuss proposed to use only DV. Brian drafted explanatory text for the use of asterisk, and the group decided to keep the asterisk designation.

• Routes data catalogue and table

Erik summarized the main changes that were done since the last meeting. The group reviewed the status of the catalogue and the table. Brian noted that some differences in the formatting compared with the format agreed at the Paris meeting still exist (also applies for the other themes).

Several changes were made during the discussion:

- Waypoint was renamed to Position.
- o For holdings, assigned RNP value for the hold (according to ICAO PANS-AIM definition) was added as a new data element.
- o Fixed Radius Transition (FRT) was added as a new data element.

• Aerodrome data catalogue and table

Thomas presented the progress since the last meeting. The group reviewed the status of the catalogue and the table.

- Magnetic Bearing additional considerations/requirements were added: When not provided by States, Magnetic Bearing should be derived based on authoritative source publication, e.g. True Bearing and Magnetic Variation.
- Touchdown zone related data elements were updated with additional considerations to reflect the fact that since there is no standard way to define touchdown zone length, that the full context of these data elements is unknown.
- On runway slope, various cases were discussed. It was decided to add in additional considerations/requirements that "state-provided values are not always an average slope between both runway ends."

• Navaids² data catalogue and table:

Matt presented the progress since the last meeting. The group reviewed the data catalogue and the table. Changes made during the WebEx meetings were reviewed and validated.

- o For GBAS Position, 1m accuracy has been added as per ICAO requirement. It was discussed why it has to be 1m and not 3m as for other navaids at the airport.
- o Jeppesen proposed that GBAS needs to be 'Routine integrity'; this was agreed to (ICAO requirement is 'Essential').

² Reviewed on Day 5 of the meeting, in WG session after the closing Plenary

2 Joint Meeting

2.1 Administration & Agenda

On the 29th of November, the group addressed organizational items, approved the minutes from the 30th meeting, and approved the agenda for the 31st meeting. The meeting was opened by Stéphane Dubet (RTCA SC-217 cochairman and EUROCAE WG-44 chairman) and Brian Gilbert (RTCA SC-217 co-chairman). The two Cochairs welcomed Mr. Jim Terpstra, former SC-217 Chairman.

Brad Miller, in his role of DFO, read the FAA Public meeting announcement. Rebecca Morrison, RTCA Program Director, presented the RTCA IPR Policy. Sergiu Marzak, EUROCAE Technical Program Manager, presented the EUROCAE IPR Policy Call and the EUROCAE membership policy, with regard to participation in EUROCAE Working Groups.

The group reviewed the status of the action items and the overall progress of the work on the draft document, in particular, the integration of the material (WPs) already approved. It was decided to maintain the references to the approved WPs and files references in the action item spreadsheet as well as to create a dedicated folder on the Workspace where the Master document and all approved WPs will be stored.

2.2 Working Group Session

The group continued the work in WG session addressing the following topics:

Rules for navigation data preparation (Action 30-08)

The group reviewed the proposed finalized text in Sections 2.1 and 2.2, implementing the changes agreed to at the Paris meeting. The group agreed that the final version is ready to be integrated in the master document.

Review and update of Appendix I (Action 29-02)

The group reviewed the revised draft Appendix I and made changes. It was decided to update the presentation of the references, e.g. to remove the postal addresses from which publications can be obtained. It was decided to include references to relevant FAA and EASA publications. This content will move into Section 1 of the document. It was decided to remove the references to DEMETER and AUGUR, as those were considered not relevant for the document. The reference to the EUROCONTROL on-line Final Approach Segment Data Block (FAS DB) tool will be kept. All EUROCONTROL Agency publications in section I.4 will be removed. A reference to the EUROCONTROL Specification for the Origination of Aeronautical Data will be added.

New Action 31-02: Sasho to provide reference to the EUROCONTROL Specification on Data Origination.³

Regarding references to FAA and EASA publications, it was agreed that Jeff M. and Brad provide relevant FAA references to Scott. Scott will send those references to Sasho, who will ask Ken Engelstad to provide relevant EASA publications references.

New Action 31-03: Jeff M., Brad, Scott and Sasho to obtain references to relevant FAA and EASA publications.

Use of 'Critical' integrity parameter by an application requiring 'Essential' (Action 29-05)

The paper was presented by Thomas. The objective of the paper was to propose an additional sentence in Section 1.5 – Integrity, regarding the relation between 'Critical' and 'Essential' integrity levels. The aim was to make it clear that a given application that requires Essential integrity on a data element can use it if the integrity required in DO-201B DQR tables for the element is 'Critical'; in other words, Thomas was proposing to state that 'Critical' integrity inherently satisfies 'Essential' integrity requirements. It was determined that it could not be

³ The reference was provided and the action was closed on 1 December 2017.

guaranteed inherently, and the group developed text to clarify that Essential data processing requirements must be followed if intended for an application requiring Essential integrity.

The group agreed to the inclusion of the revised text in the master document. The agreed text is as follows: "Critical data that is used by an application that requires Essential data must meet the processing requirements for Essential. For example, data provided with a CRC to ensure critical integrity may be provided to downstream users requiring essential integrity with CRC removed if the data provider has ensured/followed Essential level processes. The same applies for Essential and Routine data."

Procedure encoding (Action 25-22)

Kevin presented the draft revised text in Section 3. The objective has been to remove information that is already present in other publications. The group reviewed and introduced changes during the discussion.

It was discussed whether or not to keep Figures 3-21 through 3-36. It was noted that these figures reflected the operational environment around 20 years ago. It was decided to replace these figures by compiling a list of new examples of positive and negative practices related to coding of procedures. The goal is to identify current issues and best practices related to procedure design and illustrate them in the document.

An important consideration was which charts should be used; it was agreed that, preferably, the charts should come from different companies/organizations.

It was considered useful to include a few unidentifiable negative examples (how not to design procedures). Jim proposed to provide existing material for those issues.

It was agreed that it will be necessary to create a dedicated sub-team to address the examples and to produce the new figures. The sub-team will be led by David Baker.

The first step will be to compile a list of ideas/examples of positive (primarily) and negative practices. The sources for those examples will have to be identified. The sub-team will work via WebEx meetings.

New Action 31-04: David Baker, with the participation of Greg, Lee, Erik, Steve, Mike and Kevin to review Figures 3-21 through 3-36 and compile a list of new examples of positive and negative practices related to coding of procedures.

At the end of the working session on Thursday, the group continued the work on compiling the list of positive and negative practices. A first draft list of issues was created. The sub-team will continue the work as per <u>Action</u> <u>31-04</u>.

<u>Consideration of State-provided procedure coding Action: 30-02:</u> Torsten Domroes presented the paper. The group reviewed the proposed text, made changes, and agreed the revised text is ready to be included in the master document. It was decided to add this text in Section 3 between paragraphs 3.3.1 and 3.3.2.

The following topics/remaining open actions were discussed:

RNP Holding – as part of Action 25-22, the issues related to coding of RNP holding procedures were discussed. A new Action 31-05 was created: Jeff M., Erik, David B, Sasho, Steve to draft a paragraph on RNP holding.

<u>New Working Papers</u> – it was decided that WPs will use references to the Section numbers in the Master document. Brian highlighted the good practice of authors of papers to check the text after it has been integrated in the Master document by the Document Editor. It was agreed that this practice is applied for all WPs.

<u>Action 29-01</u> – Coordination with SC-159 was discussed. Brad informed the group that he had an exchange with Barbara Clark and that there is no specific requirement from SC-159 for coordination. It was noted that there are DQRs with respect to GBAS in the Navaid section – position of ground station and frequency and that the idea is to make sure that those requirements are consistent with any other pertinent requirements in documents produced by SC-159. It was decided to address this during the review of the Navaid DQR catalogue and table.

Action 25-21 – The action on David to review the text in sections 2.1.5 and 2.1.6 and also consider section 2.1.7. was discussed. Previous Sections 2.1.5 and 2.1.6 are now Sections 4.2 in the new document. The text was reviewed and revised during the discussion. The text clarified the descriptions on accuracy and resolution and their use in the document. The paragraphs on accuracy values, integrity classification and quality assurance were revised. Action 25-21 was closed.

<u>Maximum Deviation</u> – Stéphane showed the provisions in ICAO Doc 9674 WGS Manual regarding accuracy and probability – reference material from science (Table 2-6). David suggested that these may be the values we use in DO-201B. Thomas stressed that the aim was to be consistent with DO-272, if possible. It was decided to not mention Maximum Deviation and related footnotes in the aerodrome DQR table were removed.

<u>Data-Driven Charting (DDC)</u> – The group discussed whether this topic needs to be covered in the updated document. If it is decided not to cover DDC, an option would be to start the development of a new standard, dedicated only to DDC. However, this may lead to overlap. FAA has already done a classification of data elements as DDC and the group has identified the data elements relevant to DDC from the PANS-AIM data catalogue not already included in DO-201B - around 120 data elements.

A new Action 31-06 was assigned to FAA to prepare material for Group decision at the next meeting.

2.3 Closing Session

The document update status was reviewed, in particular, the progress on the various sections and appendences of the document, and respective actions were confirmed.

Work status review

- Status on DQRs
 - DQR Categories
 - 'Basic' and 'Advanced' categories will only be applied to Aerodromes.
- Progress status check per theme
 - o Aerodromes: will be completed after validating two remaining references.
 - o Navaids: mostly completed but there are still some points in the Data Catalogue
 - o **Routes**: completed; editorial clean-up to be done
 - o Airspace: completed but subject to final review at the meeting in Brussels
 - o **IFP**: completed; editorial clean-up to be done.
- Remaining work:
 - o DDC: new Action 31-06 (impact to be determined)
 - Overall consistency check: to be done by editing team at the end

Document update status

- Structure of the document completed
- Section 1 completed
- Section 2 completed

- Section 3
 - o New review to be done based on text edited during the Phoenix meeting (all but the examples)
 - o Examples are to be developed in accordance with Action 31-04
- Section 4
 - Text completed
 - o Tables: as per 'Status on DQRs' above
- Appendices
 - Appendix A complete
 - o Appendices B, C, D, E, F, G and H removed
 - O Appendix I (to be moved to Section 1): ongoing review by Scott based on the review of the latest reference material, e.g. ICAO, EUROCAE, etc.
 - New Appendices :
 - NOTAM/AIRAC completed
 - PBN procedures related terminology completed
 - Abbreviations and acronyms: to be done at the end
 - Glossary: to be done at the end
 - Membership: to be done at the end

Dates of next meetings

WebEx for examples led by David have been planned for the following dates.

- 8 December 2017
- 18 January 2018
- Additional ones, if necessary.

The group looked at two options proposed by the Co-chairs in accordance with the contingency plan⁴ introduced at the previous meeting to address a potential need for delay in the delivery of the document to RTCA/EUROCAE:

- <u>Plan A</u> no change to schedule: document ready for Final Review and Comments (FRAC) after the meeting in Brussels and FRAC resolution in June 2018. The feasibility of this plan depends on the decision to be taken on whether to cover DDC or not, and progress on the procedure coding examples. If it is decided to cover DDC, this will likely make Plan A unfeasible to meet the original schedule.
- <u>Plan B</u> to have one additional meeting in October 2018 in Europe (possible locations Frankfurt or Zurich) for FRAC resolution; delivery of the document no later than 10 November 2018, so that there is no need for a formal approval from PMC.

^{- &}lt;sup>4</sup> If the Document is delivered to EUROCAE/RTCA prior to the 10th of November 2018 – no particular procedure will be needed. If delivered after the 10th of November 2018 - a formal approval by RTCA PMC will be required no later than September 2018.

Rebecca informed that during the first week of October 2018 it will not be possible for Rebecca and Sergiu to attend as they have other commitments already scheduled, so if there will be a meeting in October, it will have to be scheduled from the second week of the month onwards.

The next meeting will take place from the 26th of February through the 2nd of March 2018 in Brussels, Belgium hosted by EUROCONTROL.

Remaining meetings are foreseen for:

- 18 22 June 2018 at RTCA in Washington DC, USA hosted by RTCA (currently planned to be FRAC resolution meeting)
- Potentially an additional meeting in October 2018, if necessary to follow Plan B.

The decision on Plan A or B will be taken at the meeting in Brussels.

Stéphane highlighted the fact that in order to initiate the FRAC process there needs to be a mature document and editorial support for this document to launch the FRAC. There will be a significant amount of work associated with the comment-resolution process; there will be a need for a dedicated team - a "strike team" - to review the comments and prepare the material prior to the actual FRAC resolution meeting.

Stéphane Dubet and Brian Gilbert thanked all members for the participation and, in particular, Scott, Erik and Lee for hosting of the meeting by Honeywell, and closed the plenary meeting.

3 List of Open Actions

The following table contains a list of all open action items:

Ref#	Member/Team Assigned	Task Description
25-22	Steve, Erik, Cedric, Kevin , David, John, Brian M. Erik	Draft text on Procedure encoding - Path terminators (ARINC 424) basics (3.1.3) - Considerations for encoding of procedures in DB (3.1.1, 3.1.2, 3.2 and 3.3) including for new RNP DB Final review needed. Plus work on examples (see Action 31-04).
29-01	Leadership Team	Consider establishing formal coordination with WG-28/SC-159 on DQR for GBAS-related data.
29-02	Scott	Review and update Appendix I.
30-01	Steve	Consider requirements on additional data from ARINC 424 which is not in the ICAO Data Catalogue.
30-03	Thomas and Brian G.	Prepare a WP for the Aerodromes DQR table and catalogue for inclusion in the master document.
30-04	Matt	Prepare a WP for the Navaids DQR table and catalogue for inclusion in the master document.

Ref#	Member/Team Assigned	Task Description
30-05	Brian Murphy	Prepare a WP for the Airspace DQR table and catalogue for inclusion in the master document.
30-06	Erik	Prepare a WP for the Routes DQR table and catalogue for inclusion in the master document.
30-07	Reuss	Prepare a WP for the IFP DQR table and catalogue for inclusion in the master document.
31-03	Jeff M., Brad, Scott, Sasho	Obtain references to relevant FAA and EASA publications.
31-04	David, Erik, Steve, Mike, Kevin, Greg, Lee	To review Figures 3-21 through 3-36 and compile a list of new examples of positive and negative practices related to coding of procedures.
31-05	Jeff M., Erik, David B, Sasho, Steve	Draft a paragraph on RNP holding.
31-06	Brad, Jeff M.	To propose options on how to address Data-Driven Charting (DDC) within DO-201B (if so, indicate how) or as a separate DO-XXX.

Certified as a true and accurate summary of the meeting:

Sasho Neshevski

Secretary, RTCA SC-217, EUROCAE WG-44

Brian Gilbert

Chairman, RTCA SC-217

Stéphane Dubet

Chairman, EUROCAE WG-44