RTCA Paper No. 106-17/SC217-073
EUROCAE Paper No. EUR 131-17/WG44-30
May 15, 2017

MEETING MINUTES OF THE TWENTY-EIGHTH MEETING
JOINT RTCA SPECIAL COMMITTEE 217
EUROCAE WORKING GROUP 44

27th of February through 2nd of March 2017
Toulouse, France - Hosted by Airbus

Executive Summary

RTCA SC-217 met jointly with EUROCAE WG-44 for the Twenty-Eighth Plenary at Airbus in Toulouse, France from the 27th of February through the 2nd of March, 2017. The main objective of the meeting was to continue the revision of DO-201A/ED-77.

During the opening plenary the group addressed organizational items, approved the minutes from the 27th meeting, approved the agenda for the 28th meeting, and reviewed the status of the action items.

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

- Document structure and Introduction – the group reviewed the proposed text, noting that the text will have to be finalized at the end of the work. It was agreed to add a section on Compliance.
- NOTAM integration in Navigation Data – it was agreed that the purpose will be to provide a description of the issues and practices related to the use of NOTAMs as a new appendix.
- Timeliness of dissemination of aeronautical information – the importance of strict adherence to the AIRAC procedures was highlighted. It was agreed to keep the text descriptive, covering background, current best practices and future outlook in a SWIM environment.
- System Wide Information Management (SWIM) and Navigation Data – the group modified the proposed text, and agreed to its integration in the master document.
- Specific requirements and standards – Section 3: part of the text was reviewed. The work is ongoing; the aim is to reduce the text to eliminate duplication with other standards.
- Accuracy requirements and Error Probability – the proposals were not supported; it was agreed that the topic be progressed through the new paper on Compliance.
- Data Driven Charting (DDC) – the proposed text was reviewed. It was noted that a number of data items used in DDC are contained in the ICAO Data Catalogue and/or ARINC 424. It was agreed to include a DDC description in the applications appendix, pending updates to make it more general and eliminate language that excludes EFB applications.

A large part of the work during the meeting was dedicated to Data Quality Requirements (DQR) tables. The group applied the agreed process for reviewing and modifying the ICAO PANS-AIM Data Catalogue spreadsheets, notably on the Aerodrome Runways file. The handling of text data was discussed, stepping through the Radio Navigation Aids catalog as validation of the process.

The group agreed to add a new section defining the Navigation data catalog followed by new DQR tables. The tables will include two categories of requirements: one for standard applications such as FMS, and one for the most stringent applications such as runway safety functions. Caveat text was drafted to explain that requirements for a given application may differ from the values in the tables.

The group reviewed the document update status and agreed on the necessary changes to the structure and the content.

The meeting objectives were achieved, with all planned agenda items covered and good overall progress made.
The next meeting will take place from 19 through 23 June, 2017 in Cedar Rapids, IA, USA, hosted by Rockwell Collins. The first two days will be dedicated to working on the data catalog and DQR tables.

1 Opening Plenary

1.1 *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
Claudia Chaudhari*	RTCA	cchaudhari@rtca.org
Matthew Colburn	Boeing	matthew.j.colburn@boeing.com
Torsten Domroes	Jeppesen	torsten.domroes@jeppesen.com
Stéphane Dubet	DGAC / DSNA / SIA	stephane.dubet@aviation-civile.gouv.fr
Jean-Paul Genottin	Airbus S.A.S	jean-paul.genottin@aribus.com
François Germain	Thales	francois.germain@thalesgroup.com
Brian Gilbert	Boeing	brian.d.gilbert@boeing.com
Andrew Goldsmith	FAA	andrew.e.goldsmith@faa.gov
Eustis Gosselin	Jacobs Technology	eustis.gosselin@jacobs.com
Thomas Koebel	Airbus S.A.S.	thomas.koebel@airbus.com
Jeff Meyers*	FAA	jeffrey.meyers@faa.gov
Brad Miller	FAA	brad.miller@faa.gov
Stephen Moody	Jeppesen	stephen.moody@jeppesen.com
Brian Murphy	FAA	brian.murphy@faa.gov
Sasho Neshevski	EUROCONTROL	sasho.neshevski@eurocontrol.int
Collin Ogden	Rockwell Collins	collin.ogden@rockwellcollins.com
Jeff Plantinga	GE Aviation Systems	jeffrey.plantinga@ge.com
Erik Ringnes	Honeywell	erik.ringnes@honeywell.com
Scott Roesch	Honeywell	scott.roesch@honeywell.com
Ralf Sieprath	NAVBLUE	ralf.sieprath@navblue.aero
Anna von Groote	EUROCAE	ralf.sieprath@navblue.aero

* Participation via WebEx

1.2 *Administration & Agenda*

The meeting was opened by Stéphane Dubet (RTCA SC-217 co-chairman and EUROCAE WG-44 chairman) and Brian Gilbert (RTCA SC-217 co-chairman).

During the opening plenary session the group addressed organizational items, reviewed and approved the proposed meeting agenda for the 28th meeting, and approved the minutes from the 27th meeting.

Brad Miller, as Designated Federal Official, read the Public Meeting Announcement in accordance with the Federal Advisory Committee Act.

Brian Gilbert read the RTCA Proprietary Policy and the RTCA Committee Participation Membership Policy.

Stéphane Dubet presented the EUROCAE IPR Policy Call and the EUROCAE Membership Policy, with regard to participation in EUROCAE Working Groups.

Round-table introductions were given by each attendee.

The Group reviewed the status of the action items.

Brian Gilbert informed the group that LaDonna Handugan has left The Boeing Company and will not participate in SC-217 anymore. Matt Colburn is replacing her as a Boeing representative to the committee.

2 Working Group Session

Sub-teams report-outs

Stéphane Dubet reviewed the status of work items, as follows.

- Structure of the document: some minor changes to complete plus other actions.
- Background and PBN principles including new concepts: work to be finalized.
- Rules for navigation data preparation: an update is planned for next meeting.
- Data quality: focus on tables and contents.
- Procedure encoding: condense and just provide an overview of what coding means/implies.
- Aeronautical information basics: implement propositions made at the meetings in Seattle and Boston.
- Appendix on applications: consolidate all inputs in master draft document.

It was noted that for some of the topics there were Working Papers (WP)/Discussion Papers (DP) that would be discussed later on during the meeting.

Document Structure and Introduction (WP 25-18A)

Stephen Moody presented the paper. He noted that the text will have to be finalized at the end of the document revision, depending on the actual content of DO-201B/ED-77A. The group reviewed the text. The group discussed the terms and conventions. It was agreed to use the conventions “shall”, “should” and “will”. A discussion took place on the use of the terms “course” and “track”; it was agreed that the explanation of these two terms will be retained in the text.

It was noted that the paper does not yet cover the following two bullets of the action item:

- Prepare propositions for a new structure;
- Consider structure of e.g. ED99/DO272.

Stephen Moody will prepare a proposal on the document structure.

The relationship between ARINC 424 and DO-201/ED-77 was discussed. Brad stated from a Regulator point of view that ARINC 424 is a format but it is not considered as industry standard. The application of DO-201 was discussed. It was agreed to add a section on “Compliance”.

Action 28-01: David Baker will produce a DP on compliance to be reviewed by the group.

NOTAM integration in Navigation Data (DP 27-01)

As a way of introduction, Stéphane Dubet presented statistical data showing the very significant increase in the number of NOTAMs published worldwide, which further highlights the importance of the topic.

Torsten Domroes presented Version 0 of the paper. He explained the rules and typical use of NOTAMs to publish aeronautical information. He highlighted the problem – abuse and/or incorrect use of NOTAMs, e.g. publishing information of permanent nature.

Stéphane Dubet added that some initiatives have been taken at various levels – ICAO, State, ANSP – to mitigate the impact of abuse/incorrect use of NOTAMs such as the so called "umbrella" NOTAMs.

The group reviewed the proposed text.

Brad Miller asked for clarification with regard to the intention of the text. Brian Gilbert clarified that the purpose is to provide a description of the issues and practices related to the use of NOTAMs.

A question was raised whether a NOTAM gives permission to alter an AIP. It was recognized that some NOTAMs are incorporated into databases. Ralf Sieprath explained that it depends on the NOTAM characteristics and the implications on other products and data items and information, e.g. procedures.

Stephane Dubet recommended considering inclusion of issues with State originated NOTAMs with clear messages regarding the need for correct use of the NOTAM system.

Action 27-01: Torsten to update the paper by adding another paragraph and incorporating the comments received during the discussion.

The effect of timeliness dissemination of information (DP 27-01A)

Torsten Domroes presented Version 0 of the paper. He explained the purpose of AIRAC, highlighting the importance of strict adherence to the AIRAC procedures. The proposed text covers background, current best practices and future outlook in a SWIM environment.

David Baker highlighted the fact that there are logistical requirements related to the adherence to the AIRAC cycle. Torsten clarified that this is captured in the "Best Practice" paragraph.

Brian Gilbert noted that it should be clearer how the text is organized in terms of requirements, and explanatory. Torsten replied that the intention is to be informative; to be placed in an appendix.

Brad Miller noted that the text needs to remain descriptive – what is being done – and not use "shall" and "should".

Action 27-01: Torsten to update the text keeping it descriptive – without using "shall" and "should".

System Wide Information Management (SWIM) and Navigation Data (DP 25-23)

Sasho Neshevski presented the WP. The text was reviewed by the group. The section on information services was reduced. Torsten commented that the section on governance can be revised in line with the latest wording used at ICAO level.

Actions 25-23:

Torsten to provide some editorial comments on the last paragraph on governance.

Sasho to produce an updated version of the paper, ready for integration in the master document by the Document Editor in Section 2.4.

Revision of Section 3 (WP 25-22) - Specific requirements and standards

Kevin Carey presented the proposed revised text in Section 3. The objective of the update was to eliminate duplication with other documents.

The need for coordination between procedure design and procedure coding is deemed very important to ensure procedures are flown as intended.

Stéphane Dubet stated that the objective needs to be clear – do we want to carry over information that has been covered in ICAO, e.g. PANS OPS, and other publications, or do we want to keep only the text which is adding specific value to the document?

It was agreed that the document needs to cover only information which adds value – bringing up issues that are currently relevant.

Action 25-22: Kevin to conduct more research with respect to what elements are already covered in other publications and determine which elements are still worth keeping.

The topic of Holding Areas for RNP Airspace (RNP RNAV significant) generated a discussion. RNP holds are not yet implemented, but such procedures are expected to start to be published. It was noted that while DO-236/ED-75 describes the requirements on the NAV system, the criteria for procedure design are not yet finalized.

Action 25-22: Stephen Moody to do further research on RNP holds and to propose wording – describing the problem and proposing a way to address it.

Jeff Meyers asked if the document was to support only PBN. Brian confirmed that the document is to support NAV data, including for conventional navigation. This entails the need for including new material in the document addressing conventional navigation data and information.

Data Driven Charting (DDC) (DP 27-03)

Scott presented the draft paper. The aim was to clarify what DDC is, the intended functions, applications, etc., and how it is different from Electronic Flight Bag (EFB) charting applications.

Jeff Meyers further detailed the DDC intended functions as follows:

1. DDC is used concurrently with Fixed Chart.
2. DDC is used to support tactical modes and allow the pilot to quickly cross-check entry of procedural data into the FMS. Fixed chart is used for briefing.
3. DDC is used to support briefing and tactical modes. Reference to fixed chart is not required.

The intended functions were discussed, notably with respect to their relation to EFB.

Jeff Meyers proposed that DDC is described in the applications appendix. He highlighted the fact that a number of data items used in DDC are contained in the ICAO Data Catalogue and/or ARINC 424. It was agreed to add the text, once agreed, in the applications appendix. It was suggested that in the data tables a specific reference to DDC could be included.

Ralf Sieprath stated that currently it is not clear what DDC is and what the complete scope of DDC data is.

Brian Gilbert clarified that DO-201B is expected to be a living document, becoming the place to accommodate the need for future navigation applications.

Reuss Anderson stressed the fact that the end use is not yet clearly defined therefore the data quality requirements cannot be defined.

Stéphane Dubet reminded the conclusions from the meeting in Neu Isenburg, regarding DDC and suggested that DDC could be addressed in a second step.

Brian Gilbert suggested putting the focus on the core navigation data.

It was concluded that the text will be generalized (not limited to procedures, and also applicable to EFBs). Figures will be for illustrative purposes only the flowchart will be removed. The focus will be put on core navigation data; DDC can be addressed in a second step (which could still be in DO-201B or in a future revision).

Action 27-03: Scott to prepare a WP for the next meeting.

Data Quality Requirements (DQR) tables

The group continued the work on the drafting of DQR tables based on the data catalog. Jeff Meyers presented the work done by the sub-team since the last meeting. The group looked at the Instrument Flight procedure table. The use of 'normative' references and 'informative' references was discussed.

Jeff Meyers raised the issue that there are some difficulties in getting the latest versions of the ICAO PANS AIM document and ARINC 424.

Jeff Plantinga suggested that the term "capture rules" be replaced by "additional requirements". The proposed method of presentation of the DQR was agreed.

It was stated that direction from the Group was needed by the Sub-team to be able to move forward. Members should try and collect all relevant references (ICAO, ARINC 424) and prepare their input for discussion and review of the DQR in working group meetings.

A question was raised with regard to what the added value of reviewing line-by-line is.

Stéphane Dubet explained that the ICAO Data Catalogue is intended to assemble all data quality requirements existing in different Annexes, i.e. being a one-stop shop.

A discussion took place on the added value and usefulness of DO-201B/ED-77A. It was confirmed that - as previously agreed - this would be the DQRs, an updated list of Navigation data applications and identification of requirements from industry beyond ICAO and ARINC.

As an example to illustrate the process, the group reviewed the runway threshold data elements covering:

- Definition
- Normative references
- Informative references
- Capture rules
- Required accuracy and integrity

Accuracy requirements and Error Probability (WP 27-02)

Thomas Koebel presented the paper. The term "Accuracy" differs from the data capture and user points of view. Thomas proposed a new definition of Accuracy but there was reluctance to change the definition as proposed. Accuracies are based on confidence levels and are not guarantees, and it is impractical to require a 100% confidence level that accuracies are within a given requirement. Thomas highlighted the main issue as being the need for higher confidence. The problem is that even if there is compliance to DO-201, there may be cases where data does not meet the needs for certain applications. The notion of "known" and "unknown" errors was discussed.

Stéphane Dubet pointed out that there are plenty of references on statistical methods and probability. These are concepts that are not specific to aviation; they are widely used in other sectors.

In conclusion, the paper was not supported. The conclusion was to integrate the topic in the paper on Compliance (see Action 28-01).

Action 25-20 Draft text on Rules for navigation data preparation

- Geodesy and conventions (2.1.2.-2.1.3)

- Calculations (2.2)

Scott Roesch raised the need for support from Data Service Providers to progress the update of sections 2.1 and 2.2. It was noted that it is still under question if Section 2.2 will be needed in the revised DO-201.

DQR tables (continued)

The group continued the work on the DQR tables. A discussion took place regarding what it will mean to be DO-201B compliant. Stephane proposed introductory text for the DQR tables.

The group agreed to add a new section defining the Navigation data catalog followed by new DQR tables. The tables will include two categories of requirements: one for standard applications such as FMS, and one for the most stringent applications such as runway safety functions. Caveat text was drafted to explain that requirements for a given application may differ from the values in the tables.

The DQR tables will identify both:

- **ICAO requirements:** these are the values provided by States acting as authoritative sources for aeronautical data
- **Industry requirements:** these are the values that are deemed necessary to be provided in order to support the applications amongst those listed in Appendix A as categorized by:
    - Standard
    - Stringent

Important caveats:

- There may be multiple data quality levels corresponding to different applications, and the actual quality required for a given application may differ from the values given in the table.
- Not all publications require all data listed in the tables.
- For applications not listed in Appendix A, it is up to the application designer to determine the required quality of the data, especially if it is more stringent than the one in the tables. *ED-76/DO-200B provides in section 2.3.5 more details on mutual agreements on DQRs between supplier and user on DQRs.*

A lengthy discussion took place on the data criticality (e.g. critical vs. essential).

The runway threshold data item was reviewed as a Use Case:

ICAO

- Position: 1m/critical
- Elevation and height:
    - RWY with non-precision approaches 0,5m/essential
    - RWY with precision approaches 0,25m/critical

DO-201B Stringent category

- Position: 0,3m/critical
- Elevation – height/geoid undulation: 0,25m or 0,3m (TBC)/critical

DO-201B Standard category

- Position: 1m
- Elevation – height/geoid undulation: 0,5m/essential

DQR tables: Text data

It was noted that so far DQRs for text data have not been defined in other documents such as DO-272, DO-276.

The agreed process for addressing text elements was reviewed:

- Accuracy, as currently defined, is not applicable
- Integrity is applicable - use routine, essential or critical

The group applied the process on the **Radio navigation aids** file, discussing the assignment of integrity levels. It was stressed that it depends on the particular data item. There are no integrity requirements on text data at the ICAO level.

Ralf Sieprath questioned the added value of attributing integrity values for the operation of the data providers because all of them are already doing it as standard operating practice.

Francois Germain noted that an explanation will be needed to justify the assignment of the integrity values – the reason for the choice of the value. Several Navaid text data elements were reviewed; the group felt that only two of them – Type and Identification - needed to be assigned integrity requirements.

Stéphane Dubet reminded the agreed methodology for data items that have numerical values:

Step 1: Review existing values – is it OK? If not, change with rationale

- Common sense check
- Check with respect to DO-201A
- ARINC 424 consistency
- Issues linked to practicality
- Specific need for a given application

Step 2: Fill in the blanks (not all numerical data have accuracy or integrity requirements in the ICAO data catalog)

- Is there a value in DO-201A? In other standards? If yes, then use it as a basis and apply Step 1, as required
- Tag the other ones as “to do” items

The group agreed to use the general rule of thumb as basis for DQRs: use ICAO values as the starting point for Stringent requirements, and use DO-201B values as the starting point for Standard requirements.

Capturing the results

It was agreed that Tables per theme/sub-theme with proposed template will be provided by the leadership on the RTCA work space.

Action: Brian Gilbert to post on the work space a skeleton of the new Section 4 with Data Catalog and DQR tables to be populated by the team.

Proposed themes, based on the ICAO data catalog division:

- Aerodromes
- Airspace

- ATS routes
- Instrument Flight Procedures
- Navaids

Structure:

- All Data Catalogue per theme and sub-theme in a 1st part
- All DQRs grouped (and organized into one table per theme) in a 2nd part

DQR offline work organization was agreed to as follows:

- One group as previously identified, but with larger participation expected
- Determine DQRs for both numerical and text data elements
- One WebEx session bi-weekly

Next meeting in Cedar Rapids with:

- Monday & Tuesday – working session dedicated to DQRs
- Wednesday through Friday – regular WG-44/SC217 meeting with plenary

Brian informed that there are in total 201 data items in the 5 themes.

3 Closing Plenary

The action item list was reviewed and updated (see Section 4 below).

Review of conclusions on the Working Papers

- **NOTAMs/AIRAC Adherence**: the paper will be re-edited to avoid the use of "shall" and "should" and be more descriptive. The goal will be then to include the edited text as Appendices (action Torsten)
- **SWIM**: paper to be finalized considering feedback from Toulouse for inclusion in the Master Document - section 2.4 (action Sasho)
- **A424 encoding**: work in progress to proceed the feedback from Toulouse and also work on the examples (action Kevin)
- **DDC**: text to be edited in accordance with Toulouse feedback - not limited to procedures, also applicable to EFBs, deletion of the flowchart (action Eric)
- **Applications**: draft an Appendix A based on all available inputs for distribution to the Group (action Steve)
- **Accuracy**: topic to be addressed within the work on Compliance (action David)

Review of the document update status

- Structure of the document: new Table of Contents (action Steve)
- Section 1: Introduction, purpose, scope, terminology, conventions, 1.2 is replaced by PBN (also consider adding scalable and dynamic RNP – action Sasho), 1.3 keep and update, 1.4 to be simplified (no subsections), the rest TBD + add a subsection on compliance (action David)

- Section 2: 2.1 and 2.2 keep and update (Scott), 2.3 and 2.4 to be completely revisited - update, examples, etc. (Torsten)
- Section 3: ARNC 424 related text, complete rework in progress (Kevin), 3.4 replaced by text explaining link with AMDB (Brian)
- Appendix A in progress (action Steve)
- Executive summary, Membership, Glossary, Reference documents, revision with respect to last version: later
- Other Appendices: B and C removed, D to be checked (Eric), G to be checked (Torsten) - E, F and H removed
- New section 4 on DQR with Data Catalogue (Part 1) and DQR tables (Part 2) – action DQR Group, Brian to propose skeleton, also plan a general part on DQ considerations and other DQ characteristics
- New Appendix on NOTAM / AIRAC Adherence (action Torsten)

Dates of next meetings

The next meeting will take place from 19 through 23 June 2017 in Cedar Rapids, IA, USA, hosted by Rockwell Collins.

The dates and potential locations for the subsequent meetings were set as follows:

- 30th meeting: 11 – 15 September 2017 in Paris, hosted by EUROCAE
- 31st meeting: 27 November – 01 December 2017 in Phoenix, hosted by Honeywell.

Remaining meetings are foreseen for:

- 26 February – 02 March 2018 in Brussels, Belgium or Cologne, Germany
- June 2018 at RTCA in Washington DC, USA

In addition to these meetings, thematic WG arrangements will be maintained - the Data Quality Sub-team will hold WebEx meetings arranged by RTCA every other week.

Stéphane Dubet and Brian Gilbert wrapped up the meeting. They thanked Thomas and Jean-Paul for the hosting of the meeting by Airbus.

4 List of Open Actions

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

Ref#	Member/Team Assigned	Task Description
25-11	Scott Roesch, Erik Ringnes	Prepare draft text on applications - Flight Management Systems

Ref#	Member/Team Assigned	Task Description
25-18	**Steve**, Daniel, Burak, Brian G.	Draft text on Structure of the document - Prepare propositions for a new structure - Consider structure of e.g. ED-99/DO-272 - Adoption of requirements identification - Introduction and intended audience - Scope (navigation data)
25-19	**Sasho**, Jeff M. , Erik, Matthew Colburn	Draft text on Background and PBN principles (1.1-1.2) including new concepts
25-20	Martin, **Scott**, Sasho	Draft text on Rules for navigation data preparation - Geodesy and conventions (2.1.2.-2.1.3) - Calculations (2.2)
25-21	Stéphane, **Brad, Jeff M.**, Jens, Kim, Steve, Jeff P., Ralf, Cedric, David, Martin, Thomas, Scott, Lee	Draft text on Data quality - DQR tables (2.1.4-2.1.6) - Quality management - ref. to DO-200B (2.1.7)
25-22	Steve, Erik, Cedric, **Kevin,** David, John, Brian M.	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
25-23	Stéphane, **Torsten**, Ralf, Sasho, Martin, Brian G.	Draft text on Aeronautical information basics (2.3. - 2.4) (Annex 15, ICAO) Includes texts on: 1. SWIM and Navigation data 2. Standards for names and identifiers
27-01	Torsten Domrös, Martin Zillig, David Baker, Ralf Sieprath	Prepare DP for new appendix describing common/major issues found with State data and any related guidance as well as addressing NOTAM-related issues.
27-03	**Brad and Jeff M.** supported by Scott, Collin, Reuss, Kim, Jeff P., Jack Befus	Draft a DP on Data Driven Charting (DDC)
27-04	David Baker	Prepare DP for new and amended data elements in the data quality tables and author text explaining that is states source critical data without digital error detection it is not likely that industry will be using it for applications requiring critical data.

Ref#	Member/Team Assigned	Task Description
28-01	**David Baker**, Thomas Koebel, Jeff P.	David Baker to produce a new DP on Compliance (with input from Thomas and Jeff P.)

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