



EUR 157-18/WG96-042  
RTCA Paper 148-18/SC236-017

26 June 2018

**Minutes of Meeting**  
**EUROCAE WG-96 / RTCA SC-236 Plenary #5**  
**Standards for Wireless Avionics Intra-Communication (WAIC) Systems**  
**within 4200 - 4400 MHz**

<b>Date</b>	<b>Tuesday May 22 – Friday May 25, 2018</b>
<b>Place</b>	<b>Airbus Saint Martin du Touch 26 Chemin de l'Espeissière 31300 Toulouse</b>
<b>Venue</b>	<b>AIRBUS</b>
<b>Host</b>	<b>AIRBUS</b>
<b>Contact Persons EUROCAE RTCA</b>	<b>Anna Guégan</b> <anna.guegan@eurocae.net > Phone: +33 1 40 92 79 31 And <b>Rebecca Morrison</b> rmorrison@rtca.org +1 202-330-0654

**AGENDA**

**Tuesday May 22, 2018 1:00pm-5:00 pm**

1. Welcome/Administrative Duties
2. IPR / Membership Call-Out and Introductions
3. Acceptance of Meeting Minutes for the Fourth Joint Plenary of SC-236/WG-96 held at RTCA in February 2018
4. Review Plenary Agenda and Sub-working Group Schedule including delivery schedule for White Paper and MOPS
5. Break into Sub-working Group meetings when plenary business complete

**Wednesday May 23 – Friday May 25, 2019, 9:00 am-12:00pm**

6. Continue with Plenary or Sub-working Group Meetings

**Friday May 25, 2018, 1:00 pm – 5:00pm**

7. Continue with Plenary or Sub-working Group Meetings
8. Reports of the Sub-Working Groups
9. Status and review of the Draft Paper SC-236 Intermediate Report (dedicated for ICAO Job Card)
10. Review of Special Committee Schedule
11. Approve changes and updates to the Terms of Reference

12. New Business Discussions

13. Review of Action Items

14. Plan for next meeting

**Adjourn**

**Attachments (on RTCA web-folder):**

- Attachment A : Attendance List
- Attachment B : Action List (SC-236, WG-96 WAIC) – status May 2018
- Attachment C : WAIC SARPs-MOPS Protection Criteria and Verification Procedures.pptx
- Attachment D : SC-236 Requirements Traceability Overview 180522.pptx
- Attachment E : SC-236 SWG2-4 STPA Overview 180522.pptx.

**Appendix:**

- Appendix 1: Notes and Reports of diverse SWG discussions,
- Appendix 2: Photo of the whole working group.

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**Minutes of Meeting: May, 22<sup>nd</sup> (start time 01:00pm)**

**Agenda Item 1 - Welcome**

Rebecca Morrison (RTCA) welcomes the group to the Plenary Meeting. Welcome from Chairmen RTCA-SC236 Michael Franceschini (MRF) and EUROCAE WG-96 Robin Davies (RD) and Secretary of the Joint SC/WG Peter Anders (PA). Valentin Kretzschmar, host of the meeting venue, provides information on the location, security, web access, etc. The list of attendees is contained in Appendix 1.

**Agenda Item 2 IPR / Membership Call-Out and Introductions**

Rebecca Morrison (RTCA) gave an introduction to the RTCA meeting rules and procedures. Paul Siegmund (FAA) officially opened the public meeting of SC-236. Paul Siegmund read the federal notice related to FACA.

Rebecca Morrison explained RTCA's "Proprietary Policy" and some general information on RTCA / EUROCAE membership modalities. She referred to the standard presentation SC236\_WG96\_EUROCAE\_RTCA.pdf – RTCA workspace:

[http://workspace.rtca.org/apps/org/workgroup/sc236\\_standards\\_for\\_waic/documents.php?folder\\_id=5608](http://workspace.rtca.org/apps/org/workgroup/sc236_standards_for_waic/documents.php?folder_id=5608)

This meeting is considered as a plenary meeting. Rebecca explained some changes on the RTCA policy addressing future FAA involvement. Rebecca sent an email on 18<sup>th</sup> May to all members informing them about the new policy (SDO). Recent changes to RTCA remove FAA direct oversight and now allows industry to initiate new projects not just wait for FAA mandate. Essentially, there will be no impact on the work and the objectives for this SC.

Plenary meetings will not be announced anymore via the Federal Register. In conjunction with this alleviation, the group decided to rearrange the numbering of the past and the future Joint Working Group Meetings.

**Here is a summary of past and current Meetings:**

- August 2016 – First meeting – Plenary (Pre-joint meeting with EUROCAE WG-96)
- September 2016 – 1st Joint Plenary - Hamburg
- December 2016 – 2nd joint Plenary - College Station, TX
- February 2017 – 3rd Joint Meeting (no Plenary) Washington, DC
- May 2017 – 4th joint meeting (no Plenary) Rochester, UK
- July 2017 – 5th joint meeting (no plenary) Renton, WA (FAA)
- November 2017 – 6th Joint meeting, 3rd joint plenary – Cologne, DE
- February 2018 – 7th joint meeting, 4th joint plenary – Washington DC
- May 2018 – 8th joint meeting, 5th joint plenary – Toulouse, FR (<= Current Mtg)

**Planned:**

- August 20-24th – 9th joint meeting – RTCA – Washington DC
- October 9th-12th – 10<sup>th</sup> joint meeting Tokyo, Japan

- January 14<sup>th</sup>-18<sup>th</sup> 2019 – 11<sup>th</sup> joint meeting - Melbourne, FL (it was confirmed later during the meeting)

Another announcement is that Brain Verna will act as the FAA representative (New title: Government Authorized Representative instead of DFO). Paul remains a member of the SC-236, and also the sub-working group leader for SWG-4.

There is also a change on EUROCAE WG-96 organization. Technical Programme Manager for WG-96 is changing from Sergiu to Anna Guégan. Anna has recently joined the EUROCAE Secretariat, and will take over this responsibility from now on. Sergiu and Anna will ensure a smooth transition of the WG-96 activities.

**Agenda Item 3 - Acceptance of Meeting Minutes for the Fourth Joint Plenary of SC-236/WG-96 (Tuesday February 27th – Friday March 2nd, 2018, Washington DC, RTCA)**

MF asks the Group whether there are additional comments. Except discussion on the meeting-numbering, there were no other comments. The MoM has been accepted, and will be approved by the chairmen. See link:

[https://workspace.rtca.org/apps/org/workgroup/sc236\\_standards\\_for\\_waic/documents.php?folder\\_id=7740](https://workspace.rtca.org/apps/org/workgroup/sc236_standards_for_waic/documents.php?folder_id=7740)

**Agenda Item 4 - Review Plenary Agenda and Sub-working Group Schedule including delivery schedule for White Paper and MOPS**

General Remarks:

- WAIC MOPS document (final version) shall be postponed. ToRs must be revised. Update of ToR and preparation of the PCM required. Mike will present the Proposal of ToR on 21 June to the PCM. Details of the proposed ToR changes will be discussed at plenary level on Friday, May 25 (refer to agenda #11).
- Discussion about kind/type of the Paper to satisfy the JobCard of ICAO Annex 10 for WAIC. Three options:
  - a. **RTCA Intermediate Report** (no Final Review And Comment (FRAC) would be necessary!), however it may not be referable in ICAO documents (group considers this as an unacceptable risk).
  - b. Establish **another MOPS or MASPS** with a title like “Coexistence Criteria of WAIC and RA”. It may not contain a complete content as expected by any ordinary MOPS/MASPS. However, Rebecca states that such an “incompleteness” is not unusual (there are already examples of “incomplete” MOPS available. A FRAC needs 45 days minimum).
  - c. **MOPS”WAIC” DO-xxx (initial Issue)**; just to develop a first issue focusing on Coexistence Criteria of WAIC and RA. The same MOPS (same number, but increase version DO-xxx<sup>A</sup>) will be completed later addressing all remaining aspects (e.g. system level performance, network services, cybersecurity, on-board coexistence, and test requirements). FRAC will be needed as well. Question was raised, whether ICAO could refer to different Issues in advance, when later a second issue will be adopted by RTCA? It is concluded that this could be managed (for instance by generic referencing: “RTCA Standard DO-xxx – **latest issue**”).

After some discussions on pros-cons, the group preferred the option (b) and to establish two documents: MOPS#1<sup>11</sup> (Coexistence Criteria of WAIC and RA), and then MOPS#2 (WAIC). Titles may be discussed later in sub-working group #1. Following schedule for MOPS#1 must be considered: ICAO-FSMP needs a consolidated version in Feb 2019. That means, FRAC on coexistence MOPS/MASPS should open on 13 October, after the 10<sup>th</sup> SC-meeting; then 45 days +

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<sup>11</sup> Group decided after further discussion on Friday to use finally the document format of a **MASPS**, instead of MOPS#1 (for the first deliverable).

two weeks to review, plus 30 days to incorporate changes, which shall be finalized during the January 2019 SC-meeting in Melbourne/FL. This meeting shall consolidate the final version based on the responses from FRAC.

Uwe is assigned as the lead-editor of the documents, and so he will manage editing of MOPS#1/MASPS too.

Sanjey requests to get a RTCA Glossary, because of the manifold acronyms & abbreviations used in the administrative context (FRAC, PCM, IR, MASPS,...). Rebecca will look and find some useful link(s) – see Action item #30.

Before splitting into two breakout sessions, Mike requests the SWG-leaders to explain the objectives for these sessions.

- SWG-1 plans for the week
  - SWG#1 will work on the content of what will become MOPS#1/MASPS (coexistence WAIC/RA communication).
  - Thomas shows a presentation, summarizing all important technical criteria for protections and its challenges for testing and verification procedures. Refer to **Attachment C : WAIC SARPs-MOPS Protection Criteria and Verification Procedures.pptx**.
  
- SWG-2, joint by members of SWG-3 & 4: plans for the week
  - Steven Rines (SR) said his main objective is to continue on what documents/traceability/formal documentations are needed to define application use cases for a WAIC network.
  - SR shows a presentation on the Requirements Traceability Management, including the usage of the Tool "CASCADE", SR proposes to use the tool and overall concept of grouping and allocating requirements. SR further introduced methods of STPA (System Theoretic Process Analysis) -> **Refer to Attachment D and E**.
  - The selected applications for the collection of requirements traceability will be presented during the plenary summary on the following Friday morning.
  - Members of SWG-3 and SWG-4 joint with the SGW-2 activities, forming SGW-9 (2+3+4).

Unrelated information from Mike: the FCC has issued a request for comments on a proposal to free up the band 3.6 - 4.2 GHz for mobile broadband services. Mike is preparing a response on behalf of Honeywell and would also like to mention WAIC protection in his response. Dave Redman is also preparing a response on behalf of AVSI. --> Comments until June 1, and reply comments until June 15.

At 4pm am the plenary ended. The meeting is splitting into separate sessions of Sub-working groups.

### **Agenda Items 5, 6 and 7 - Break into Sub-working Group meetings (May, 22<sup>nd</sup> – May, 25<sup>th</sup> (11:00)**

Group notes are attached to the MoM – see Appendix 1 of this MoM.

### **Agenda items 8 - Reports of the Sub-Working Groups**

#### SWG-1 (Sanjay, Thomas)

Meeting focused on coexistence scenario between aircraft and interference environment, in the context of further develop the content of the MOPS#1/MASPS.

Appendix 1 of this MoM does contain a list of SWG-1 actions that was presented (by Uwe/Thomas) to the Plenary.

One point is highlighted concerning availability of technical justifications of coexistence between the different entities: The critical path to obtain required technical justifications is to finalize defined tests under the responsibility of AVSI (WAIC OOB testing; WAIC + RA -> RA interference testing). Results of these

tests are prerequisites to finalise the MASPS. The group hopes to see most of test results at the meeting in October (Japan).

In order to progress appropriately, the SWG-1 will have frequent webex meetings (every 2 weeks), preferred week-day is Monday morning US time.

It was decided to incorporate the current results (White paper produced by SWG#1 (Thomas main editor)) into the RTCA-MASPS format and to provide this document then to the whole SC-236 before next meeting in Washington (August, 2018). This shall be done supported by Rebecca/Uwe/Thomas.

A short survey around the table, triggered by Sanjay, to explore individual perceptions concerning the level of progress: Each member confirmed that a good progress was made during the week.

#### SWG-2, joint by members of SWG-3 & 4 (SR):

SR presents the work results of the week. Appendix 1 of the MoM contains the list of achievements and SWG-2 internal Actions.

SWG-2 has selected six examples of real-aviation-applications (use cases of avionics functions communicating via WAIC).

One example is shown to the plenary → the Model of VHF communication. SR explained different ways of requirements capturing for this application, and how specific WAIC requirements will be derived thereof.

The Group finds the approach generally useful, in order to be able extracting requirements for the WAIC network subsequently. That would allow selecting such requirements that are relevant for the WAIC-MOPS, and to deselect others, which are not linked to the MOPS, because of its application-specific nature.

It is highly recommended to consider specific “clusters” of requirements from the beginning on (e.g. cluster related to “spectrum level” or to “power level”). Another distinction should be considered: “Safety” and “Data Security”. Mixing both in one cluster could raise issues later on, because compliance demonstration methods and means to comply for both items are managed in different ways and by different organizations in some cases. Mixing of both items would make compliance demonstrations even more complicated. There should be also different “clusters” with respect to the “normal operation” and other phases of the life cycle of the product. Some aspects, shown by SR, are more related to maintenance procedures and configuration management purposes (e.g. installation control, software loading, etc...), which may have not their right places in this schema.

To mitigate “unnecessary mixture”, SR considers establishing a so-called requirements-metrics concept to master different “clusters” as mentioned above.

#### **Agenda Item 9 Status and review of the Draft Paper SC-236 Intermediate Report (dedicated for ICAO Job Card)**

This topic has been discussed already – see above. The Group decided to propose the format as a MASPS, with following basic objectives:

Propose adding to the ToR a new MASPS DO-YYY document:

- Title: Minimum Aviation System Performance Specification for Coexistence of Wireless Avionics Intra-Communication Systems within 4200-4400 MHz,
- Address coexistence **between** aircraft, and with Radio Altimeters at WAIC system level only, but it will not address WAIC component issues, neither aircraft intra interference scenario.
- MASPS is considered as being a more appropriate format to address inter-aircraft coexistence,
- FRAC in Oct 2018; internal readiness Jan 2019 (after SC-236 Meeting in Jan/19),
- Presentation to ICAO/ FSMP (ICAO Frequency Spectrum Management Panel) WG/8 (Release by FSMP/3) on Jan. 21-29, 2019,
- Completion scheduled in March 2019.

Remark: If the RTCA PMC will recommend a different format of this document (e.g. MOPS, PS,...) the group would accept, provided that it will not change the schedule frame, and the basic objectives of the document. It is more important that ICAO could use a reference to a RTCA standard in ANNEX 10.

#### **Agenda Item 10. Review of Special Committee Schedule**

The introduction of the new deliverable MASPS in Feb 2019 does influence the current focus and workload of the SC-236/WG-96, which in turn have an impact to the overall schedule; It is assumed that significant more time is needed to finalize the original planned MOPS. Therefore, the Group proposes an extension of finalization of the MOPS DO-XXX to Feb 2021, (remark – later discussion results in to select Dec 2021). Title and intended content remains: **Minimum Operating Performance Specification for Wireless Avionics Intra-Communication Equipment within 4200-4400MHz.**

#### **Agenda Item 11. Approve changes and updates to the Terms of Reference**

The Group proposes to revise the **TERMS OF REFERENCE Special Committee (SC) 236 Standards for Wireless Avionics Intra-Communication System (WAIC) within 4200-4400 MHz.**

The proposed changes are:

1. Change FAA responsibly from Paul (DFO) to Brain Verna (GAR),
2. Adding a new deliverable: MASPS DO-YYYY "**Minimum Aviation System Performance Specification (MASPS) for Coexistence of Wireless Avionics Intra- Communication Systems within 4200-4400 MHz**", by March 2019,
3. Extend the final delivery of "**Minimum Operating Performance Specification (MOPS) for Wireless Avionics Intra-Communication Equipment within 4200-4400 MHz**" until Dec 2021.

The second change is justified by following (refer to ToR change proposal):

In order to deliver the coexistence parameters to ICAO, so that ICAO could reference this RTCA document in February 2019, the committee will create a MASPS that identifies the requirements on the WAIC system for sharing the system as well as recommended test procedures for verifying coexistence of WAIC system and radio altimeters.

Note, in Feb 2019, the document will be in the final phase (post FRAC, and be consolidated by SC-236 during the January meeting in Melbourne), however it is still not published by RTCA. A DO-number has been assigned by RTCA before it will enter the FRAC phase.

Mike will join the RTCA PMC meeting on 21<sup>st</sup> June 2018 in order to explain and justify the proposed changes on ToR of SC-236. RD will take the information and forward it to the EUROCAE TAC meeting August, 29th 2019.

#### **Agenda Item 12. New Business Discussions**

The new RTCA Policy relation to FAA has been discussed in the beginning of the meeting as well changes of personal responsibilities from FAA (DFO) and EUROCAE WG-96 organization. (Technical Programme Manager change). General schedule and proposed change of the ToRs have been discussed.

No other points have been raised.

#### **Agenda Item 13. Review of Action Items**

At plenary level, there is only one new Action item for Rebecca. See Attachment B : Action List (SC-236-WG-96 WAIC) – status May 2018 (uploaded by Secretary).

#### **Agenda Item 14. Plan for next meeting**

The next Joint meeting is planned on 20<sup>th</sup> August. – 24<sup>th</sup> August Washington/DC (hosted by RTCA HQ).

#### **Agenda item 15 Adjourn (Friday 16:00)**

The chairmen thanked participants for fruitful contributions and especially Valentin for the hosting facilities.

***Complied by Peter Anders***  
***Approved by Michael Franceschini***  
***Approved by Robin Davies***

Secretary of Joint SC-236/WG-96  
Co-Chairmen of SC-236/WG-96 (RTCA)  
Co-Chairmen of SC-236/WG-96 (EUROCAE)



**Appendix 1: Notes and Records of SWGs sessions** <sup>2</sup>

**SWG-1 Break out session:**

**Table 1: SWG-1 Action Items**

<b>AI Number</b>	<b>Topic</b>	<b>Priority</b>	<b>AI Owner</b>
1	<b>RadAlt Protection:</b> Possible new coexistence scenario and interference environment (two aircraft in flight passing each other on perpendicular routes) to be considered for altitude >5,000 ft	1	TM
2	<b>RadAlt Protection:</b> Consider old airports with parallel runways not in accordance with IATA apron design rules (runway separation y 1.4 km).	1	TM
3	<b>WAIC Protection:</b> Possible new coexistence scenario (impact of RadAlts on board aircraft on the apron and taxiway onto WAIC system on board landing aircraft)	1	TM
4	<b>WAIC Protection:</b> Possible new coexistence scenario (impact of RadAlts onboard landing aircraft onto WAIC systems on board taxiing aircrafts' WAIC systems	1	TM
5	<b>Radiation Measurement Procedure:</b> Extend the measurements at window height with additional heights around the window center line to account for radiation components in the range of [+20°] around the horizontal plane. --> editorial change: add text stating that worst-case coupling between WAIC TX antenna and measurement antenna must be captured and that the measurement antenna has to be positioned on the hemisphere accordingly.	2	SF
6	<b>RadAlt onto WAIC Susceptibility Test:</b> Define RadAlt test signal characteristics (power, slope, # of RadAlt signals per interference source)	2	MF
7	<b>WAIC onto WAIC Susceptibility Test:</b> Define WAIC test signal characteristics	2	SB
8	<b>WAIC interference susceptibility test:</b> Test mode for victim aircraft; provide more detailed description of test mode (the test mode should also reflect the WAIC system's operational conditions relevant for altitudes below x)	1	SM
9	<b>WAIC interference susceptibility test:</b> Add a paragraph expressing that the test only needs to be performed if the WAIC system is operated at altitude below x.	2	SM
10	<b>INPUT for AI 3:</b> Provide IPL values for RadAlt signals in AI 3	1	MF

<sup>2</sup> These following notes were compiled by Uwe Schwark, and have being copied in this MoM.

**SWG-9 (2+3+4) Break out session:**

The following part has been recorded by SR (took the lead of the combined three Sub-working Group Session). It includes also the ACTION at Sub-working Groups level.

**ACTION:** SHR - Define WAIC reporting of configuration requirement per conversation with Mike F. (Should fall out of Tire Press UC discussion).

**ACTION:** SHR - Review DO-355/356 for specific applicability to wireless data load and configuration!

**ACTION:** SHR: Update Cascade header in all documents to change allocateTo categories "System" and "Function" to "Spectrum" and "Services", respectively.

Team decision: bring linked requirements forward into each successive document.

**ACTION:** SHR: Update FRD to include linked requirements from VHF Audio Use Case. VHF Audio Use case assessment is complete.

**SWG-2 Near-term To Do:**

VHF A429 maintenance assessment

STPA-Sec description, losses and control diagrams - **ACTION:** Jeff Cyr Due: 27 June 2018

Tire pressure monitor assessment

STPA-Sec description, losses and control diagrams - **ACTION:** Steve Rines (Gregory?) Due: 20 June 2018

Cabin lighting assessment

STPA-Sec description, losses and control diagrams - **ACTION:** Paul Sigmund

Oxygen mask trigger use case (not available today) - **ACTION:** Oliver Luecke - COMPLETE

Wing collision monitor use case (not available today) - **ACTION:** Radek Z Due: 20 June 2018

Multi-application WAIC use case (not available today) - **ACTION:** Valentin Kretzschmar Due: 13 Aug 2018

- Different DAL/SAL applications
- Different traffic (performance) requirements (e.g., real-time or streaming vs. best effort)
- High availability?
- Data/control isolation between applications
- Channel sharing (e.g., once there are more applications than there are channels)
- Security isolation
- Authentication method for shared environment
- Interoperability required for shared resources/services (compatible equipment services)
- Prioritization of application for access to media and services

No WebEx next week. 6 June is next WebEx.

**ACTION:** SHR - Update XSTAMPP STPA-Sec file for VHF Audio Use Case based on SWG-2/3/4 presentation mark-ups.

**ACTION:** SHR - Put XSTAMPP file on RTCA Work Space for access by other participants.

**ACTION:** SHR - Insert Radek's Plenary #4 & #5 notes and this document into SWG-2 running notes.

**ACTION:** SHR - Provide guidance for documenting linkage between Use Cases and STPA-Sec tables and between tables and FRD.

**Appendix 2: Photo of the whole Group**

