

**PLENARY MEETING MINUTES
MEETING OF SPECIAL COMMITTEE 236**

FIRST MEETING

**Standards for Wireless Avionics Intra-Communication System (WAIC) within
4200-4400 MHz**

Date: August 9-10, 2016

Time: 9:00 a.m. – 5:00 p.m.

Place: RTCA, Inc.
1150 18th Street, NW, Suite 450
Washington, DC 20036

Chairman: Michael R. Franceschini

Designated Federal Official: Paul Siegmund

Attendees:

Name	Company/Agency
Bajekal, Sanjay	United Technologies Corporation
Baker, Gregory	Aviation Spectrum Resources, Inc.
Chen, Zhong	Honeywell International, Inc.
Ely, Jay	NASA
Franceschini, Michael	Honeywell International, Inc.
Goode, Steve	Rockwell Collins, Inc.
Hughes, Darlene*	Universal Avionics Systems Corp.
Khaouly, Nazih*	Federal Aviation Administration
KRETZSCHMAR, Valentin	Airbus
Lee, Kent	GE Aviation
Lynch, Michael	United Technologies Corporation
Marston, Scott*	The Boeing Company
Meyerhoff, Thomas	Airbus
Morrison, Rebecca	RTCA, Inc.
Redman, David	Aerospace Vehicle Systems Institute
Rines, Steven*	Zodiac Aerospace
Roy, Andrew	Aviation Spectrum Resources, Inc.

Siegmund, Paul	Federal Aviation Administration
Swiatek, Kevin*	United Parcel Service
Totten, Tim	United Parcel Service
Verna, Brian	Federal Aviation Administration
Williams, Brett*	True Blue Power
Yonemoto, Naruto	Electronic Navigation Research Institute (...)
Zakrzewski, Radek	United Technologies Corporation

*Attended via WexEx

Plenary Discussion:

AGENDA

Tuesday August 9, 2016 – 9:00am – 5:00pm

- 1) Welcome
- 2) Administrative Remarks
- 3) Introductions
- 4) Agenda Review
- 5) RTCA Overview Presentation
 - Background on RTCA, MOPS, and Process
- 6) SC-236 Scope and Terms of Reference review
- 7) Background Presentation on WAIC
- 8) Background Presentation on WG-96 status and work
- 9) SC-236 Structure and Organization of Work
- 10) Proposed Schedule
- 11) RTCA workspace presentation
- 12) Other Business
- 13) Date and Place of Next Meeting
- 14) Adjourn

Thursday, August 10, 2016 – 9:00am – 4:00pm

Continuation of Plenary or Working Group Session

Plenary Discussion:

Day 1

Agenda Item 1 – Welcome

RM welcomed everyone and opened the workgroup session.

Agenda Item 2 – Administrative remarks

Paul Sigmund read the public meeting announcement on behalf of FAA.

RM reminded the RTCA proprietary reference and membership policies.

DR enquired about sharing policies for proprietary content produced in AVSI and RTCA workgroups respectively. MRF answered that this topic shall be addressed during the next AVSI meeting happening the following week (cw33). Until then, no proprietary content shall be brought up during the RTCA SC236 KOM.

Agenda Item 3 – Introductions

A round table was performed to identify each participant in the room and through Webex

Agenda Item 4 – Agenda review

RM presented the agenda for the two days, which was accepted with no modifications.

Agenda Item 7 – RTCA overview presentation

MRF presented an overview of WAIC background including the justification for such frequency, technical status, and past achievements conducted within AVSI AFE 73-76 workgroups. It highlighted the topic of radio-altimeter interference being of primary importance.

PS asked if the radio-altimeter interference topic was considering interference from the ground or from the aircraft itself. MRF answered that the worst-case interference scenario was concerning the aircraft radio-altimeter.

DR asked if SC236 activity would include SC 216 activity on network security, and, on a larger scale, what would be the place of security in the SC236 activity.

Discussion led to the conclusion that SC236 MOPS should address the topic of security and ensure compatibility with SC216 output. It was highlighted that SC216 aims to provide requirements and best practices, but no specific implementation detail. This approach is similar to what is envisaged in SC236. PS pointed that even though MOPS should not include implementation specifics, its content should aim to be implementable.

DR asked if SC236 is formally related to an ICAO activity. MRF answers that there is no formal link.

Agenda Item 8 – Background Presentation on WG-96 status and work

VK presented the status of EUROCAE WG96 Process Specification activity as well as a proposal schedule for the joint RTCA/EUROCAE MOPS elaboration activity.

TM presented the structure of the draft PS document and the technical status of WG96 activity.

PS noticed that the MOPS should contain elements that helps integrating the system at aircraft level, although that's not usually the scope of MOPS (which aim at supporting the obtention of a TSO for a component)

It was noted that the same question was encountered for ED112. The MOPS need to include requirements for TSO obtention, but could also include some aircraft level integration elements. These elements shall be labeled as such and clearly separated from the main MOPS requirements.

TM pointed that the scope of the MOPS scope should be clearly defined. Does it need to include technical details and performances requirements or should it be the purpose of another document?

MRF answered that for instance, interoperability between WAIC systems doesn't fall into the scope of MOPS whereas coexistence and interference immunity does.

Agenda Item 6 – SC-236 Scope and Terms of Reference review

PS proposed a review of the Terms of Reference

RM noticed that, SC236 and WG 96 being a joint workgroup, there will be one unique document produced. RTCA and EUROCAE versions will be identical.

PS noted that determining a worst case interference scenario will be key to the activity

PS insisted that "safety" should be taken in a broad way: not only addressing safety requirements from applications using a WAIC system, but also ensuring that WAIC systems do not have safety impact on other aircraft functions and systems.

MRF mentioned that taking into account the adjacent frequency bands will be required, as so-called out of band threats. It was noted protecting from these threats might be challenging as we have no control and cannot anticipate on future usages in those bands.

DR asked if SC236 could access SC216 documents. RM answered positively. She mentioned that any reference to a requirement from another SC needs to be specific and referenced in case this requirement is modified by this SC afterwards.

RZ noticed that the schedules differ between EUROCAE and RTCA. RM answered that reason behind this is that the document needs to be submitted to EUROCAE before it is submitted to RTCA.

MRF proposed to envisage different interference scenarios between ground (more interferences) and (less interferences). For instance, in case of a WAIC system self-check, the acceptable level interference would be higher on the ground, taking into account that interference level would decrease in flight. It was mentioned that any impact that this could have (increase of message error rate at the gate for instance) would need to be acceptable for the application using the WAIC system.

The question remains open.

Lunch break

Agenda Item 5 – RTCA overview presentation

RM presented an overview of RTCA and MOPS process.

MRF asked if the working groups were open to the public. KH answered that public parties can participate to plenaries under the Chair discretion but cannot take part into working group activities without being part of RTCA and the SC. However, minutes of meeting and agendas are available to the public on the RTCA website.

MRF asked if he could name a co-chairman. RM answered that he could appoint a chair in his stead in case he cannot travel, or that there could be a co-chairman which would need to be approved by the PMC

MRF asked if the content presented during workgroup session is RTCA property. KH answered that what is presented in plenaries is not necessarily RTCA property. The content of the final MOPS document is RTCA property and external parties must request RTCA membership to have access to it. RTCA member can request a free electronic copy.

RZ asked if it was ok to distribute draft MOPS document. KH answered positively, as long as it remains in the company which is an RTCA member.

MRF asked who could use the workspace for documents. RM answered that everyone in the committee could access anything. There is also the possibility to manage permissions if need be.

Agenda Item 9 – SC236 Structure and Organization of work

MRF proposed a round table to assess what are the expertises in the workgroup and potential contributions.

Based on that round table, MRF proposed to start establishing sub working groups that will progress through telecons in between plenaries and present status during plenaries.

The proposed sub-working groups are

- **PHY/MAC layer:** waveform, spectral confinement, co-channel
- **Interference/coexistence:** from WAIC, to WAIC, WAIC-WAIC
- **Network architecture/System integration**
- **Integrity** (safety/reliability)
- **Interfaces with bus/protocols** (AFDX)
- **Security** TBD

This proposition shall be consolidated until next plenary.

AI1 MRF: to consolidate the subgroups structure and naming, introduce each with a few sentence, circulate to the group (including WG96)

AI2 All: to reflect on subgroup structure and comment for validation at next plenary

RZ asked what would be the content of the MOPS. It was concluded that the MOPS should focus on requirements, and suggestion on how to achieve them, rather than specifying technical solutions.

However, a certain level of technical detail could be required in order to reach the objective co-existence (i. e. channel scheme, access scheme...). Moreover, the performance of a WAIC system being heavily dependent of its environment, the MOPS could contain elements related to aircraft integration. As these are usually not in the scope of MOPS, the shall be included in appendices or in a white paper (this second solution would require changing ToR)

TM mentioned that standards such as ETSI gives indication about coexistence within the 2.4 GHz frequency band while being agnostic to technologies. It highlights the possibility of defining co-existence requirements without leaning too much on WAIC system implementation details.

RM presented the RTCA drafting guide to MOPS document structure. VK asked if the drafting guide was harmonized with EUROCAE.

AI3 RM - to check if there is such a drafting guide on EUROCAE side.

MRF presented the Aeromacs MOPS, highlighting that the topic being close to WAIC, it could be a good reference in terms of content and scope.

PS asked if MOPS should include a minimum safety level. TM and VK answered that there would probably be a variety of DAL level functions using WAIC system, and that safety would be addressed at network integration level.

MRF suggested that there could be classes of WAIC components (chip) depending on the intended usage the associated safety level of supported functions.

Discussion should be continued.

TM proposed to have a specific subgroup to define interference scenarios, including intended in-band emission and Radio-alt. He suggested that this activity should be the first to be tackled innSC236 activities.

DR asked if passive sensors would be considered in the scope of WAIC. MRF answered that for some very low power sensors, it could be done. However, for RFID-type sensors, the power level considered for WAIC would be too low.

VK asked what where would the channelization scheme be addressed, both in terms of channel size and channel allocation. MRF answered these topics would be addressed in waveform and coexistence WGs

Meeting adjourned for the day.

Day 2

Agenda Item 11 – RTCA workspace presentation

RM presented the workspace usage, including posting documents, commenting, using group communication between workspace users

She mentioned that the workspace allowed for creating subgroups to reflect the decided working structure, with possibilities for document management and group communication at that level.

MRF asked if Robin Davies was still the chair of WG96. RZ answered positively. PA is secretary to both workgroups. Whenever there are joint meetings, RD and MRF act as a co-chairs. It will be clarified in the next plenary how the two workgroups will work together.

MRF asked it would be possible to collocate AVSI workshops with RTCA sub-working group session. DR answered it would be workable. TM pointed that this proposition should extend to EUROCAE participants as well TM presented a summary of all the points discussed during day 1 and proposed a distribution of these points in terms of topics and chronological priority. The proposition was discussed and completed. It was proposed that this summary could be used as a way to determine the most important topics and whether they should be included in the MOPS or not.

The question was raised about how and where to address the integration of a WAIC system into an aircraft. It was mentioned this topic is not the primary purpose of the MOPS, although it can be integrated as appendix. PS pointed that it can also take the form of an AC or AMC (pushed by EASA/FAA). It was also asked if this was partly covered within WG 96 PS. It was decided to keep this question and raise it again during next plenary.

There was discussion of about what would be the scope of MOPS: The following point were raised:

- Should the MOPS apply at component level or at system level?
- Should the MOPS include elements of network integration?
- Should MOPS contain recommendation on control plane?
- Should MOPS include elements regarding link and system integrity?
- What performance parameter should MOPS address? Latency? At link level, end-to-end?
- Should MOPS only address radio requirements?

MRF proposed to list all parameters that would characterize WAIC system performances. The MOPS would include several component classes depending based on these parameters. All classes would be covered by the same TSO.

MRF suggested on way to address system level topics would be to extend MOPS with MASPS.

To conclude on the MOPS content definition, MRF proposed that a list of parameters characterizing the WAIC performances shall be produced until next plenary. The decision on which parameters will be included in MOPS and which will be disseminated through White Paper will be decided by vote during next plenary.

TM pointed that it would be difficult to have a final status on this question for next plenary. It was concluded that this would be a first vote allowing narrowing the possibilities and there would be a second iteration later.

AI4 All: to come with parameters and items required to characterize a WAIC system and which one should be in the MOPS for next plenary (ex: MER, latency, receiver sensitivity). Vote to be included in the agenda.

RM enquired about the due date for opening comments on MOPS final draft from EUROCAE side

AI5 VK: to enquire on when is the due date for opening comment on the MOPS from EUROCAE side, and duration of the comment phase

AI6 VK: to prepare AFDX presentation for next time.

Lunch break

Agenda Item 10 – Proposed schedule

RM showed a preliminary schedule. The workgroup took some minutes to complete it. FRAC need to be completed between plenary meetings 10 and 11; this phase should last at least 6 calendar weeks. Next US plenary (#2) is proposed during cw 48 (6-7-8). It shall include some time for sub group work as well. Washington is proposed as location. Plenary #3 is proposed cw9 2017. Need to consider if it's compatible with a potential ICAO meeting. Plenary #4 will be collocated with EUROCAE symposium, end of April, location TBD. Plenary #5 mid-July cw 29 TBD. Plenary #6 placeholder in November 2017, VK proposed to host it Toulouse. Meetings for 2018 will need to comply with public comment phase from EUROCAE side (earlier). Plenary #9 will be the RTCA release for comment.

Note: A detailed schedule with more information on goals for each of the plenaries will be presented at the first joint plenary.

Agenda Item 12 – AOB

TM showed a view of the different documents (MOPS, SARPS, other) and potential gap-filling document to complete the MOPS. The question was asked: what was required to obtain the license to transmit for WAIC transmitters from FCC: SARPS, MOPS, or other? MOPS could include some transmission performance aspects to cover that.

AI7 BV: to enquires to FAA spectrum office what is the recommended approach with respect to FCC expectations

AI8 All: Reflect on main interference scenario to consider:
Aircraft landing
Aircraft on taxi way
Aircraft at terminal (Gate)

MRF suggested that everyone could review DO345/346 as a reference for MOPS

AI9 All: RM to create a folder on workspace to host home assignment documents

The security topic was discussed. Security coverage is expected from the authorities. ED 72 contains some generic requirements but is probably not detailed enough. WG 96 PS security section can also be used as a starting point. It will be determined later whether these considerations are part of the MOPS or go into an appendix.

AI10 RM: To organize a meeting before next plenary to status on home assignment (12th September)

The plenary addressed the preliminary schedule by setting milestone objective for each of the plenary meetings. RM mentioned that a document editor should be assigned before plenary #2.

Meeting adjourned.

Actions

AI1 MRF: to consolidate the subgroups structure and naming, introduce each with a few sentence, circulate to the group (including WG96)

AI2 All: to reflect on subgroup structure and comment for validation at next plenary

AI3 RM - to check if there is such a drafting guide on EUROCAE side.

AI4 All: come with parameters and items required to characterize a WAIC system and which one should be in the MOPS for next plenary (ex: MER, latency, receiver sensitivity). Vote to be included in the agenda.

AI5 VK: enquire on when is the due date for opening comment on the MOPS from EUROCAE side, and duration of the comment phase

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