



EUR 52-18 / WG82-56
RTCA Paper No. 123-18/SC222-058

St Denis, 16 Febr 2018
Washington, 1 May 2018

**Minutes of
Working Group of the whole meeting of RTCA SC-222 (Meeting #28) and EUROCAE WORKING
GROUP 82 (Meeting #30)
“New Air-Ground Data Link Technologies”
related to
SATCOM**

Date	<i>Tuesday 6th February and Wednesday 7th February</i>
Place	<i>Virtual Plenary Meeting (WEBEX)</i>
Venue	---
Hosted by	RTCA

Participants:

Name	Company	6 Feb	7 Feb
Lorena Albiol	INDRA	X	X
Maqbool Aliani	Ligado		
Darrell Angregg	Rockwell Collins		
Martin Arndt	Cobham		X
John Bard	Thales	X	X
Laurent Cadiet	Airbus	X	X
Cristian Bertoldi	Airbus	X	X
Kevan Bracken	INMARSAT	X	X
Alan Schuster Bruce	INMARSAT	X	X
Andrew IVes	INMARSAT	X	X
Joan Manuel Cebrian	INDRA		X
Sachin Chhibber	Ligado		
Adrian Cioranu	EUROCAE	X	X
Ricardo De Sousa	NATS UK		X
Nikos Fistas	EUROCONTROL	X	X
Johan Gericke	COBHAM SATCOM	X	X
Victor Gheorghian	Bombardier	X	X
Jose Godoy	ARINC		
David Green	Rockwell Collins	X	X
Ann Heinke	Overlook		
Karan Hofmann	RTCA	X	X

Mike Hooper	Iridium		
Keith Howland	Thales		
James Klopfenstein	Rockwell Collins		
Rainer Koll	Stellar Aerospace	X	X
Stefano La Barbera	Thales Alenia Space - Italy	X	
Chuck LaBerge	LaBerge Engineering	X	X
Ana Mirsayar	Thales		
Ryan Mustoe	The Boeing Co		
Ayaz Nemat	L3		
Gurjinder Rakkar	The Boeing Co		
Dave Robinson	FAA (SC-222 DFO)	X	X
Philippe Sacre	EUROCONTROL		
Armin Schlereth	DFS (Chair WG-82)	X	X
Stephane Tamalet	Airbus		
Richard Tapp	Honeywell	X	X
George Torgerson	The Boeing Co		
Mark Vesely	Bombardier		
Steve Van Trees	FAA	X	
Jim Williams	Unmanned Solutions	X	
Radek Zaruba	Honeywell	X	X
Chew Keng Boon	CAAS	X	X
Gonzalo Pietro	ENAIRES	X	X

DOCUMENTS

Agenda Item – WG-82	Title	File name
2	WG-82 Calling notice	WG-82 Draft Calling notice Meeting 29.doc
4	Minutes of last meetings	222__WP206_222_27_82_Meeting_29_draft_minutes_ver0_2_KH.pdf
Agenda Item – SC-222	Title	File name
1	Agenda(s)	222aWP201_222agn27 – Final-revision.pdf
2	Minutes of last meetings	222__26_82_Meeting_28_final_minutes.doc
3	Characteristics of unmanned aircraft systems and spectrum requirements to support their safe operation in non-segregated airspace	R-REP-M.2172-2009-MSW-E.docx

PRESENTATIONS

Agenda Item – WG82	Title	File name
5	ICAO COM Panel: SATCOM activities – Update on PT-S	ICAO CP PT-S update February 2017_V01.pptx
5	PJ14 EECNS Solution PJ14.02.02 EUROCAE WG-82 update	PJ14-02-02_EUROCAE-WG82(Feb2018).pdf
6a	MOPS FOR AVIONICS SUPPORTING NGSS	ED-243 (2018-01-18).docx
6a	MOPS comment table – no title	ED-243 MOPS Comment table – all (2018-01-18).xlsx
6b	SATCOM as HF alternative	SATCOM as HF alternative v02.pptx
8a	ATN over SATCOM	ATN over SATCOM v06.pptx
8b	Iris Overview	Iris_Overview_WG82_v1.1.pptx
8c	Iris Precursor – Business Case; Operational Integration	Iris Precursor – Business Case_Operational Integration V3.pptx
Agenda Item – SC-222	Title	File name
3	Security Recommendations When Using IP Based Systems to Deliver AMS(R)S	Security Recommendations When Using IP Based Systems to Deliver AMS(R)S.pptx
4	RTCA SC-222/SC-228 Inter-SC Requirements and Agreements – 228 – ISRA-002 10/7/2016	SC228 SC222 ISRA 20180206 V2.pptx
5	MASPS extract – no title	DO-343B Att1 draft 1.pdf

1 Welcome, Introductions, Administrative Remarks by Special Committee Leadership

The meeting was split into 2 parts. On the 5th and 6th February morning sessions, it was a EUROCAE WG-82 only meeting. In the afternoon a joint RTCA SC-222 and EUROCAE WG-82 meeting was held (see also separate agenda of this meeting). All these meetings have been conducted as Internet meetings.

Chuck Laberge and Armin Schlereth welcomed the group. Main items were related to INMARSAT SBB update for secure VoIP and SC-228 coordination on support for Command and Control communications via SATCOM. This time no presentation/contributions have been given by IRIDIUM and LIGADO.

Before starting the meetings, the FACA statement was read by the SC-222 Designated Federal Officer and the IPR and participation statements from RTCA and EUROCAE side were given.

2 APPROVAL OF THE AGENDA

Due to the meeting organization there have been 2 separate agendas. One for the WG-82 only part and one for the joint session of RTCA SC-222 and EUROCAE WG-82.

The final agenda of the EUROCAE WG-82 only meeting looked as follows:

Agenda EUROCAE WG82 only:

First day: 6th February 2018 (10:00 am – 1:00 pm)

Morning Session (WG-82 only)

- 1. Welcome & Introduction**
- 2. Approval of the agenda**
- 3. IPR and EUROCAE membership**
- 4. Minutes of last meeting (→ TOR WG-82 status)**
- 5. Coordination with other GROUPS (ECTL, ...)**
(EUROCAE, RTCA, ICAO, SESAR, AEEC)
- 6. SATCOM MOPS (ED-243) development (HONEYWELL)**
 - a. Draft of Annex E changes for secure VoIP**
 - b. Draft of the “HF-replacement” paper**

Afternoon Session (2:00 pm to 5:00 pm)

- 7. Joint session with RTCA SC-222 → see separate agenda for the joint session**

Second day: 7th February 2018 (9:00 am – 1:00 pm)

Morning Session (WG-82 only)

- 8. Presentation of general interest**
 - a. ATN over SATCOM (HONEYWELL)**
 - b. Status of IRIS programme (INMARSAT)**
 - c. IRIS Precursor – Business Case & OPS Integration (NATS)**
- 9. AOB**
- 10. Summary & Next Meeting**

Afternoon Session (2:00 pm to 5:00pm)

Joint session with RTCA SC-222 → see separate agenda for the joint session

The final agenda of the joint sessions of RTCA SC-222 and EUROCAE WG-82 looked as follows:

Agenda of joint meeting of RTCA SC-222 and EUROCAE WG-82

Tuesday - Wednesday, February 6-7, 2018

All times are Eastern Standard Time (UTC -5)

08:00 – 12:00 Plenary:

Welcome, Introductions, Administrative Remarks by Special Committee Leadership

- Designated Federal Official (DFO): Mr. David Robinson
- Chair RTCA-SC-222: Dr. Chuck LaBerge, LaBerge Engineering
- Chair EUROCAE WG-82: Dr. Armin Schlereth, DFS

1. Agenda Overview
2. Review/Approve prior Plenary Meeting Summary – (action item status)
3. SC-228 IRSA Discussion
4. Presentation of general interest
 - a. Security Recommendations When Using IP Based Systems to Deliver AMS(R)S - AIRBUS
5. Updates on DO-343B/ED-242A and DO-262D/ED-243A
 - a. SATCOM MASPS DO-343B Att1 update
6. Detailed Work Plan for SC-222 and WG-82
7. Establish Agenda, Date and Place for next meeting
8. Review of Action Items
9. Adjourn – Plenary meeting

3 Minutes of last meeting

The minutes of the last meeting were approved after taking into account comments from the group. The action item list has been reviewed. The updated action item list is outlined at the end of the present minutes.

Armin explained that the TOR for WG-82 have been accepted by the EUROCAE TAC (Technical Advisory Committee) with some editorial changes outlining the need to re-visit the time planning for Revision B of SATCOM MASPS and MOPS end of 2018. These Revisions are planned to include SATCOM Performance Class A material. Deadline for these 2 Revisions have been indicated “end of 2020 TBC” in the TOR.

4 Coordination with other GROUPs

EUROCAE

Armin informed the group about the Kick-off meeting of WG-108 dealing with ANT-IPS. The Kick-off meeting took place from 1-2 February 2018. It is now planned to synchronize to the work already done within RTCA SC-223. Plan is to publish an ATN-IPS profile in 2018.

ICAO

Nikos Fistas, Rapporteur of CP PT-S of ICAO, presented at the first day of the meeting an overview of the actual status of work within PT-S. The original time planning is still valid as follows:

Delivery time planning of SATCOM SARPS and Manual:

Delivery Date: Q4 / 2018

Effective: July 2020

Applicability: November 2020

These documents are mainly based on SATCOM Performance Class B. Due to the fact, that the ICAO PBCS document is not available in time, it is intended to provide the SATCOM technical requirements for SATCOM Class B and at least some recommendation regarding SATCOM Performance Class A requirements in the Manual (ICAO Doc 9925). Focus is currently on the more stringent RCP130 values compared to RSP160. Currently there is a discussion ongoing regarding the need for another measurement point between CNP and SSP.

RTCA

See item on coordination with RTCA SC-228.

AEEC

No input provided at the meeting.

SESAR

Stephane la Barbera gave an overview of the actual work done within SESAR PJ14.02.02. on future SATCOM (Performance Class A). His presentation gave more detailed information especially about the deliverables and when they would be available. Currently time schedule looks as follows:

- SPR, INTEROP and TS/IRS are planned as draft 1 for end April 2018,
- OSED (OPS concept) is also under development, but deadline not yet defined.

Based on this schedule the June meeting of WG-82 will reserve according time to discuss these first draft documents.

5 SATCOM MOPS (DO-262D/ED-243A) development

Draft Annex E changes for secure VoIP

Radek presented to both WGs proposed changes to the Annex E (INMARSAT SBB) related to secure VoIP. All the items have been discussed. The actual status is outlined in the according Excel-Sheet, which is available on the WGs internet workspace.

Draft of the "HF-replacement" paper

Radek gave a presentation to both WGs on this subject. This covers the second new item on WG-82 TOR change on INMARSAT SBB. The presentation gives an overview of documents related to that matter from EASA, EU Operational Regulations, ICAO SUPP and the FAA regulations. From the regulatory perspective, the need for HF is primarily imposed by the oceanic airspace operations defined in ICAO SUPPs. But it is well known that HF provide poor voice quality and it can even happen that the system is not available for a significant amount of

time. Further on the outcome of an AIRBUS safety analysis for A320, A330, A350 and A380 aircraft type was summarized providing the final statement, that HF equipment is not required onboard from the aircraft safety analysis perspective. The need for two independent SATCOM systems is imposed only by the operational regulations (EASA IR-OPS, ICAO SUPPs) which ask for two independent long-range communication systems. In that context the term “independent” needs further discussion about the accurate meaning, e.g. what (if any) redundancy is required in the space and ground segment.

The way forward requires active work with authorities to promote the necessary regulatory changes, address the open issues as far as possible and finally make the required provisions in MOPS and MASPS. A list of open issues (such as polar coverage) to be addressed are outlined at the end of Radek’s slide presentation. The slide presentation has been uploaded on the WG’s workspace.

Finally, it was agreed that Radek and Dave will write an ICAO PT-S WP on the HF-replacement issue. This paper will describe the service benefits of two or more satellites operating efficiently in separate service domains i.e..... (ACD, AISD, PIESD) without interference and meeting RCP integrity, availability and continuity requirements. Whether HF remains on-board is an operational consideration, not a technical one.

6 SATCOM MASPS (DO-343B/ED-242A) development

Alan Schuster-Bruce (INMARSAT) presented an update of the SATCOM MASPS material for DO.343B Att1 (INMARSAT SBB) covering secure VoIP. The group agreed on the proposed changes.

7 Presentation of general interest

ATN over SATCOM

Radek Zaruba (Honeywell) gave a slide presentation on this subject to WG-82. The slide presentation is available on WG’s workspace.

This presentation discusses the scenarios of airborne equipage and ground equipage related to ATN B1, B2 and FANS and the potential IPS transition scenarios. It concludes with the following statements:

- SATCOM will play a vital role in the future IPS transition
 - Can enable seamless worldwide accommodation of aircraft equipped with different datalink technologies
- Opens the door to a single stack aircraft by enabling IPS globally
 - FANS 1/A+ ACARS applications remain in place but use IPS network stack instead of ACARS stack
- In the transition period it may be beneficial if we could get SATCOM accepted as sufficient means for datalink in continental airspace
 - Could have similar implications for equipage as HF removal, as long as loss of datalink in continental airspace remains MINOR safety hazard (which is the case for ATN-B2).
 - OSI over SATCOM may then encourage some regions to go for ATN over IPS ground deployment, knowing that they can accommodate OSI and IPS aircraft without having to do deploy terrestrial OSI infrastructure.
 - IPS over SATCOM may on the other hand encourage earlier IPS aircraft deployment, knowing that these aircraft can be accommodated in OSI and FANS 1/A+ airspaces.
- SATCOM Class B should be considered as enabler for En-Route FANS 1/A+ operations in continental US.

Due to the importance of the transition to ATN/IPS (EUROCAE MOPS/MASPS Revision B) it has been agreed to make it a regular agenda item for WG-82.

Status of IRIS programme

Alan Schuster-Bruce (INMARSAT) gave a slide presentation on this subject to WG-82. The slide presentation is available on WG's workspace.

He first outlined the results within IRIS Precursor program, which have been reached so far such as completion of flight trials in 2016 demonstrating the performance of ATN/OSI. The System Safety and Certification are progressing, the target remains to launch the certification process with EASA in 2018. IRIS Precursor program will be finalized in 2018.

The new IRIS program will start in 2018 and is planned to be finished end of 2020. It is split in two parts called IOC (Initial Operation Capability) and FOC (Final Operation Capability). IOC and FOC consists of the following 3 work streams:

Work Stream 1: Iris with IOC implementation.

Deliver Iris system with initial operational capabilities

Upgrade terminals to support ATN/OSI

Integrate Iris system into the SESAR Very Large-Scale Demonstrations

Work Stream 2: Iris with FOC Design

*Prepare for a seamless evolution from the Iris IOC services to Iris FOC deployment by consolidation of technology and business roadmaps, in collaboration with EC and SESAR
A Long-Term R&D element which includes the future migration to ATN/IPS, RPAS, netted voice and other future concepts.*

Work Stream 3: Implement activities which are transversal to work streams 1 & 2

Key tasks: Programme management, collaboration with SESAR, and standardization

The IRIS Long Term (FOC) covers SATCOM Performance Class A capability. In that context it is also planned to have BOEING participating in the project.

IRIS Precursor – Business Case & OPS Integration

Ricardo de Sousa (NATS) gave a slide presentation on this subject to WG-82. The slide presentation is available on WG's workspace.

The presentation covered the following major items:

- SATCOM Specific Benefits
- AU Considerations (equipment)
- Iris into European DLS
- Iris in Regulatory developments

The presentation highlighted some key factors in the adoption of Iris in Europe in the near-term including the specific benefits of delivering datalink services via SATCOM over and above the operational benefits of the underlying datalink applications themselves; the possible cases for early adoption by certain airspace users such as transatlantic flights; the need to confirm SATCOM as a compliant technology in support of Implementing Rules in Europe, along with VDL.

Armin mentioned that there will be a specific Sub work package in the upcoming CEF CALL 2017 project on DLS dealing especially with other data link systems such as SATCOM. One major item in that context is to clarify how to integrate it into a European wide data link network.

Security Recommendations When Using IP Based Systems to Deliver AMS(R)S

Cristian Bertoldi (AIRBUS) gave a slide presentation on this subject to both RTCA SC-222 and EUROCAE WG-82. The slide presentation is available on WG's workspace.

In this presentation it was stated that taking in consideration the complexity of an aircraft architecture, one can say that Information security is a mandatory core topic to be taken in consideration for certification purposes. Therefore, a new Appendix to the security section of

SATCOM MASPS is proposed for further review by the groups. In order to expedite the work on this subject the group agreed to review the proposed text and have a dedicated WEBEX in March for further discussion on the feedback received.

8 SC-228 ISRA Discussion

Jim Williams (Unmanned Solutions) gave a slide presentation on this subject to both RTCA SC-222 and EUROCAE WG-82. In summary the following requirements have to be covered by a CC SATCOM link:

- 1) Support of 2000 UA
- 2) 10 – 100 kbps per UA (Peak!)
- 3) Voice latency of 390 millisecond maximum
- 4) Use of protected spectrum (L-Band)

It was agreed that both WGs will review SC-228 slides and material (ITU M.2127) to provide feedback until mid-June 2018, so that feedback can be discussed at the next plenary meeting in June.

9 Establish Agenda, Date and Place of next meeting

RTCA SC-222 and EUROCAE WG-82 agreed on the following planning:

WEBEX's:

- **15.03.2018 3pm to 5pm CET:** Discussion of AIRBUS material on security item
- **9.04.2018 2pm to 5pm CET:** Draft SATCOM TSO discussion

Meetings:

- **SC-222/WG-82 Plenary: 26.06.2018 2pm to 28.06.2018 3pm (all CET)**
in Cologne (EASA facilities), Germany

Action items

RTCA SC-222 / EUROCAE WG-82 29th meeting: 2.11.2017 and 8.11.2017

Action#	Content	Responsible	Deadline	Status
A29-01	Coordinate TSO/ETSO development activities between SC-222/WG-82	Armin/Chuck	ongoing	Open
A29-02	Send any information related to EASA activities to Alan, Radek, Stephan (AIRBUS) and Armin	David (DFO-FAA)	ongoing	Open
A29-03	Coordinate June 2018 meeting at EASA with Friedhelm Runge (EASA)	Armin	31.01.2018	Closed

RTCA SC-222 / EUROCAE WG-82 30th meeting: 6.02.2018 and 7.02.2018

Action#	Content	Responsible	Deadline	Status
A30-01	Dave Robinson to distribute the Draft SATCOM TSO and a summary of SATCOM TSO issues to be discussed	Dave (DFO)	3.04.2018	Open
A30-02	Distribute WEBEX Info for 9 th April WEBEXs to discuss Draft SATCOM TSO items	Chuck/Armin	28.02.2018	Open
A30-03	Distribute WEBEX Info for 15 th March WEBEX to discuss AIRBUS security material	Chuck/Armin	28.02.2018	Open
A30-04	Find out about SATCOM TSO responsible person at EASA	Armin	28.02.2018	Open
A30-05	Review on AIRBUS material on security (Annex E to the MASPS proposal etc.) → to be sent to Chuck and Armin	all	9.03.2018	Open
A30-06	HF replacement issue: Feedback on regulatory and technical items on Radek's summary	Friedhelm (EASA)	At June 2018 meeting	Open
A30-07	Write a Paper to further discuss HF-replacement issue as draft MASPS Appendix.	Radek	15.06.2018	Open
A30-08	Radek and Dave to write an ICAO PT-S WP on the Dual Satellite Simultaneous Service issue	Radek/Dave	20.04.2018	Open
A30-09	Review of SC-228 slides and material (ITU M.2127) to provide feedback on the following items: <ul style="list-style-type: none"> 5) Support of 2000 UA 6) 10 – 100 kbps per UA (Peak!) 7) Voice latency of 390 millisecond maximum 8) Use of protected spectrum (L-Band) 	all	15.06.2018	Open