

MINUTES OF THE Eighteenth SC-223 PLENARY MEETING
“Internet Protocol Suite (IPS) and AeroMACS”

DATE: April 26-28, 2016
TIME: 9 a.m. – 5 p.m. Tuesday –Wednesday
9 a.m. – 12 p.m. Thursday

PLACE: RTCA, Inc.
1150 18th Street NW Ste 910 Washington, DC 20036

CONTACT: Jennifer Iversen, Program Director
(202) 330-0662 or jiversen@rtca.org

Attendees:

Aloke Roy	Chairman	Honeywell International, Inc.	
Brent Phillips	DFO	Federal Aviation Administration	
Dongsong Zeng	Secretary	The MITRE Corporation	
Rafael Apaza		NASA	Via WebEx
Bruce Eckstein		Harris Corporation	
Jennifer Iversen		RTCA, Inc.	
Paul Mettus		LS Technology LLC	
Timothy Mitchell		The Boeing Company	Via WebEx
Yasuto Sumiya		Electronica Navigation Research Institute (ENRI)	
Todd Kilbourne		Systems Egnuity, Inc.	
Greg Saccone		The Boeing Company	
Tom McParland		BCI	
Antonio Correias		Airtel ATN	
Danny Bharj		Inmarsat	
David Robinson		Federal Aviation Administration	
George Emilio		Lockheed Martin	
Chris Wargo		MOSAIC ATM	Via WebEx

In accordance with the Federal Advisory Committee Act, Brent Phillips, Federal Aviation Administration (FAA), was the Designated Federal Official for this meeting.

AGENDA

1. Welcome, Introductions, Administrative Remarks
2. Review RTCA Process Presentation
3. Review of the updated SC-223 Terms of Reference
4. Review of current State of Industry Standards
 - a. ICAO WG-I
 - b. AEEC IPS Sub Committee
5. Current State of Industry Activities
 - a. SESAR Programs
 - b. ESA IRIS Precursor
 - c. Other
6. Develop Work Plan for SC-223
 - a. Dependencies on other RTCA Special Committees
 - b. Safety / Hazard Assessment Need
 - c. Prioritized Action Plan
 - d. Special Committee Structure
7. IPS Technical Discussions
8. Any Other Topics of Interest
9. Plans for Next Meetings

Agenda Items 1. Welcome, Introductions, Administrative Remarks

Aloke Roy, Honeywell, welcomed the participants and reviewed the agenda.

Agenda Items 2. Review RTCA Process Presentation

In accordance with RTCA policy, Brent Phillips, the designated FAA representative, opened the meeting by reading the following text: “In accordance with the Federal Advisory Committee Act, this Advisory Committee meeting is OPEN TO THE PUBLIC. Notice of the meeting was published in the Federal Register on: March 15, 2016. Attendance is open to the interested public. With the approval of the Chairman, members of public may present oral or written statements at the meeting. Persons wishing to present or obtain information should coordinate with RTCA Program Director – Jennifer Iversen and the Chair – Aloke Roy”

Brent also announced the RTCA Proprietary References Policy and Membership Policy (see SC-223 DFO Public Announcement April2016.pptx).

Agenda Item 3. Review of the updated SC-223 Terms of Reference

Aloke and the working group reviewed the current SC-223 Terms of Reference (RTCA Paper No. 319-15/PMC-1419, September 22, 2015).

Action Item P18-1: Aloke to add ARINC Project Paper 658 IPS, DO-350 Baseline 2 SPR, DO-351 Baseline 2 Interop, DO-352 FANS Baseline 2 Interop, and DO-353 ATN B1 and B2 Interop to the initial documents in TOR.

The role of secretary for SC-223 is currently open. Dongsong Zeng from MITRE volunteered for this position. After committee deliberations, Dr. Dongsong Zeng (MITRE) was selected as the new secretary for SC-223 secretary.

Agenda Item 4. Review of Current State of Industry Standards

4a. ICAO WG-I

Tom McParland, BCI, proposed that SC-223 IPS profile and MOPS should be used to update ICAO IPS Guidance and Technical Manual. The special committee agreed and made Decision P1-1.

Decision 1: SC-223 IPS profile and MOPS will be used to update ICAO IPS Guidance and Technical Manual.

4b. AEEC IPS Sub Committee

Greg Saccone, Boeing, co-chair of AEEC IPS Sub-committee, presented the AEEC Internet Protocol Suite (IPS) for Aeronautical Safety Services Roadmap slides (see 05d IPS_Aero 2016 RevA.pptx). The AEEC IPS APIM 15-004 was approved by AEEC Mid-Term Session in September, 2015. The AEEC IPS Sub Committee plans to complete IPS standards in the following two steps:

Step 1: 18-month planning activity with five 2-day meetings, potentially involving ICAO, RTCA, EUROCAE, etc. (2015 to 2017); and

Step 2: Standards writing step (2017 to 2019).

Chris Wargo, MOSAIC ATM, recommended that ARINC664 Avionics Full-Duplex Switched Ethernet (AFDX), a generic IP stack, could provide some useful information to IPS development.

Agenda Item 5. Current State of Industry Activities

5a. SESAR Programs

No representative from SESAR attended the meeting this time.

Action Item P18-2: Antonio Correias, AirTel ATN, to confirm with SESAR whether there are any IPS related projects in SESAR.

5b. ESA IRIS Precursor

Danny Bharj, Inmarsat, presented a briefing on IRIS, an European satellite data link for continental areas (see RTCA 223_Iris_v3.pptx).

IRIS project has two phases:

Phase 1: IRIS Precursor 2014-2017: a DLK service to complement VDL2 for AOC / CPDLC and i4D; and

Phase 2: IRIS Service Evolution 2016-2018.

5c. Others

Dongsong Zeng, MITRE, presented the performance-based link management options for advanced air traffic services slides (see MITRE Performance Based Link Management Options_SC-223.pdf). The presented performance-based link management includes both multi-link serial utilization and multi-link parallel utilization concepts for potential IPS network performance enhancement.

Decision 2: Multi-link management is in the IPS scope, but the details need further analysis and discussion.

Yasuto Sumiya, National Institute of Maritime, Port and Aviation Technology Electronic Navigation Research Institute (MPAT/ENRI), presented an update on the Status of ENRI’s Communication Research and Development Program for RTCA SC223 (see k2_ENRI_SC223forIPS_2016Apr.ppt).

Agenda Item 6. Develop Work Plan for SC-223

6a. Dependencies on other RTCA Special Committees

Aloke presented the Honeywell Perspective of Internet Protocol Suite for Safety Services (see RTCA-SC223-01-Initial-Work-Plan-Honeywell_042616.pptx). Figure 1 summarizes the IPS standardization plans of ICAO WG-I, RTCA SC-223 and AECC IPS work group.




 <ul style="list-style-type: none"> • Completion and evolution of IPS technical provisions and guidance material • Proposed working structure: <ul style="list-style-type: none"> - WG-I - IPS Mobility Sub-WG - IPS Security Sub-WG - See next chart for current work plan • Deliverable <ul style="list-style-type: none"> - Doc. 9896 <p>Ref: ICAO CP WG-I 19, WP03</p>	 <ul style="list-style-type: none"> • Terms of Reference covers: • IPS Protocol Profiles: <ul style="list-style-type: none"> - Current RFCs in Doc 9896 - Add RFCs from WG-I that addresses mobility, multilink, security, ... • MOPS: <ul style="list-style-type: none"> - Allocate performance / QoS requirements from SC-214 / SC-206; RCP - Expand WG-I Technical Requirements (if needed) - Define test scenarios & use cases 	 <ul style="list-style-type: none"> • Phase 1: Aircraft architecture & roadmap. Should include: <ul style="list-style-type: none"> - Protocol boundary - Interfaces - Transition Aspects • Phase 2: Specifications <ul style="list-style-type: none"> - Airline/Operator requirements - System & Security Mgmt. - Domain isolation, port filtering, firewall - Management protocol & MIBs
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Figure 1. IPS Standardization Plans of ICAO WG-I, RTCA SC-223 and AEEC IPS Sub-committee

The proposed approach for initial RTCA SC-223 work is as follows.

- Define the scope of IPS
 - In terms of OSI 7-layer stack
 - In terms of functions and protocol elements at each IP layer
 - Define the interfaces [Upper, lower and management]
- Identify the IETF RFCs that can be profiled immediately:
 - User Datagram Protocol (UDP) RFC 768
 - Transmission Control Protocol (TCP) RFC 793
 - Internet Protocol Version 6 (IPv6) RFC 2460
 - QoS & Priority Management (DiffServ & PHB) RFCs 2475 & 3260
 - Boundary Gateway Protocol (BGP) RFC 4271
 - Others: TLS, SSL, HTTP, HTTPS, FTP, ICMP,??
- Multi-link and Mobility Management
 - Work with ICAO as it defines the requirements for global interoperability
 - Develop technical profiles for RFCs once the ICAO requirements are mature
- Next steps
 - Scope of MOPS and potential start date

The special committee discussed and agreed with the proposed approach for initial SC-223 work.

Action Item P18-3: Brent to check with FAA about GA participation in IPS data communication and FAA data communication safety and security assessment and requirements

The SC-223 IPS standards development has dependencies on activities of other standardization entities such as ICAO CP WG-I, SC-222, SC-206, SC-214, AEEC IPS Sub-Committee, etc. SC-223 will monitor the progress of other IPS related standards work and if necessary an ISRA can be established to share information between RTCA special committees.

6b. Safety / Hazard Assessment Need

The committee discussed about the safety and hazard assessment need for IPS standards and more information is needed.

Action Item P18-4: Bruce Eckstein, Harris, to provide communication (e.g., VDL and AeroMACS) related system level safety analyses.

Regarding ATN OSI, Greg Saccone, Boeing, confirmed that for avionics, the assurance level of ATN applications is Level C, and the assurance level of ATN protocol stack is Level D; for ground implementation, the applications are at DAL 3, and communication link is at DAL 4.

The committee discussed about the design assurance levels for IPS implementation and tasked David with Action Item P1-5.

Action Item P18-5: David Robinson, FAA, to provide information on Design Assurance Level (DAL) for IPS and the need for IPS MASPS.

6c. Prioritized Action Plan

The committee believes that a prioritized action plan should be determined in the future when it is ready to do so.

6d. Special Committee Structure

The SC-223 will continue to only meet in plenary for now until a need to create additional working groups is identified.

Agenda Item 7. IPS Technical Discussions

The committee discussed the content of draft 2nd edition ICAO Doc 9896 IPS technical manual from ICAO CP WG-I_20 meeting (Montreal, March 2016) and made the following decisions P1-3 through P1-9.

Decision 3: Dialogue service is not within IPS profile scope, but in the MOPS scope

Decision 4: Mobility handling needs to wait for ICAO WG-I decision

Decision 5: Security needs to wait for ICAO WG-I decision and FAA requirements

Decision 6: Multi-Homing and Multi-link needs to be brought up to ICAO WG-I for further investigation

Decision 7: DNS is contingent on ICAO mobility decision

Decision 8: Leave UAS accommodation in a long term parking lot

Decision 9: Change TOR schedule to Profile 2017/12 and MOPS 2019/12

The committee generated Action Item P1-6 through Action Item P1-19.

Action Item P18-6: Aloke to inform ICAO WG-I about ICAO Doc9896 Section 2.2 Link Layer Requirements, in which interface requirements should not be local issues.

Action Item P18-7: Dongsong to generate a work sheet of RFC list.

Action Item P18-8: Aloke to check with SC-206 for the needs of IP services like FTP, Telnet, SNMP, etc.

Action Item P18-9: Bruce, Danny and David to check whether RFC 2488 Enhancing TCP over Satellite Channels is needed by IPS.

Action Item P18-10: Alope and Brent to continue coordinating with EUROCAE about global harmonization and EUROCAE participation in IPS standardization.

Action Item P18-11: Alope to bring the TOR modification request to next PMC for approval.

Action Item P18-12: Brent reach out to NIST for the latest version of USGv6 on the profile for IPv6 in US Government.

Action Item P18-13: All members are invited to identify any other profiles that can be shared in the group.

Action Item P18-14: Alope to draft a working paper for ICAO WG-I on the scope and function of IPS. based on USGv6_v1 structure

Action Item P18-15: Alope and David to coordinate with SC-222 about SATCOM providers' participation in IPS standardization.

Action Item P18-16: Members are invited to develop profiles for RFCs that are within the scope and bring to the next meeting as a strawman proposal.

Action Item P18-17: Dongsong to develop initial draft profile for RFC 768 User Datagram Protocol, August 1980.

Action Item P18-18: Paul and Alope to develop initial draft profile for RFC 791 Internet Protocol.

Action Item P18-19: Bruce and Antonio to develop initial draft profile for RFC 793 Transmission Control Protocol (TCP), September 1981.

Agenda Item 8. Any Other Topics of Interest

No other topics of interest were raised during the meeting.

Agenda Item 9. Plans for Next Meetings

Decision 10: SC-223 plans to have four meetings per year

Decision 11: Next meeting is planned to be at RTCA from August 17-19, 2016.

The meeting adjourned at noon, Thursday, April 28, 2016.

List of Action Items

Action Item #	Action Content	Responsible	Due Date	Status
P18-1	Add ARINC658, DO-350, DO-351, DO-352, and DO-353 to the initial documents in TOR	Alope Roy	August 17, 2016	Open
P18-2	Confirm with SESAR whether there are any IPS related projects in SESAR	Antonio Correas	August 17, 2016	Open

P18-3	Check with FAA about GA participation in IPS data communication and FAA data communication safety and security assessment and requirements	Brent Phillips	August 17, 2016	Open
P18-4	Provide communication related system level safety analyses	Bruce Eckstein	August 17, 2016	Open
P18-5	Provide information on Design Assurance Level (DAL) for IPS and the need for IPS MASPS	David Robinson	August 17, 2016	Open
P18-6	Inform ICAO WG-I about ICAO Doc9896 Section 2.2 Link Layer Requirements, in which interface requirements should not be local issues	Aloke Roy	Next WG-I meeting in May 2016	Open
P18-7	Generate a work sheet of RFC list	Dongsong Zeng	August 17, 2016	Open
P18-8	Check with SC-206 for the needs of IP services like FTP, Telnet, SNMP, etc.	Aloke Roy	August 17, 2016	Open
P18-9	Check whether RFC 2488 Enhancing TCP over Satellite Channels is needed by IPS	Bruce Eckstein, Danny Bharj and David Robinson	August 17, 2016	Open
P18-10	Continue coordinating with EUROCAE about global harmonization and EUROCAE participation in IPS standardization	Aloke Roy and Brent Phillips	August 17, 2016	Open
P18-11	Bring the TOR modification request to next PMC for approval	Aloke Roy	Next PMC meeting in June 2016	Open
P18-12	Reach out to NIST for the latest version of USGv6 on the profile for IPv6 in US Government	Brent Phillips	August 17, 2016	Open
P18-13	Identify any other profiles that can be shared in the group	All SC-223 members	August 17, 2016	Open
P18-14	Draft a working paper for ICAO WG-I on the scope and function of IPS based on USGv6_v1 structure	Aloke Roy	August 17, 2016	Open
P18-15	Coordinate with SC-222 about SATCOM providers' participation	Aloke Roy and David Robinson	August 17, 2016	Open
P18-16	Members are invited to develop profiles for RFCs that are within the scope and bring to the next meeting as a strawman proposal	All SC-223 members	August 17, 2016	Open
P18-17	Develop initial draft profile for RFC 768 User Datagram Protocol, August 1980	Dongsong Zeng	August 17, 2016	Open
P18-18	Develop initial draft profile for RFC 791 Internet Protocol	Paul Mettus and Aloke Roy	August 17, 2016	Open

April 28, 2016

P18-19	Develop initial draft profile for RFC 793 Transmission Control Protocol (TCP), September 1981	Bruce Eckstein and Antonio Correas	August 17, 2016	Open
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Dongsong Zeng
Secretary

CERTIFIED as a true and accurate summary of the meeting.

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Aloke Roy
Chairman