

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

**DATE:** August 17-19, 2016  
**TIME:** 9 a.m. – 5 p.m. Wednesday - Thursday  
9 a.m. – 12 p.m. Friday

**PLACE:** RTCA, Inc.  
1150 18<sup>th</sup> Street NW Ste 910 Washington, DC 20036

**CONTACT:** Rebecca Morrison, Program Director  
(202) 330-0654 or [rmorrison@rtca.org](mailto:rmorrison@rtca.org)

Attendees:

Aloke Roy	Chairman	Honeywell International, Inc.	
Brent Phillips	DFO	Federal Aviation Administration	
Rebecca Morrison	Program Director	RTCA, Inc.	
Dongsong Zeng	Secretary	The MITRE Corporation	
Rafael Apaza		NASA	
Bruce Eckstein		Harris Corporation	
Gregg Nesemeier		Federal Aviation Administration	
Hoang Tran		Federal Aviation Administration	
Neal Khaouly		Federal Aviation Administration	
Pete Skaves		Federal Aviation Administration	
Paul Mettus		LS Technology LLC	
Madhu Niraula		Rockwell Collins, Inc.	
Eric Nixon		Engility Corporation	
TD Toler		Federal Aviation Administration	
Bill Holtzman		MOSAIC ATM	
Amado Royola		Telrad Networks	
Shoichi Hanatani		Hitachi	
Antonio Correias		Airtel ATN	
David Robinson		Federal Aviation Administration	
Brian Crowe		Hitachi	Via WebEx
Nikolaos Fistas		EUROCONTROL	Via WebEx
Nima PourNejatian		WiMAX Forum	Via WebEx
Greg Saccone		The Boeing Company	Via WebEx

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

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## AGENDA

1. Welcome, Introductions, Administrative Remarks
2. Review of Current State of Industry Standards
  - a. ICAO WG-I
  - b. AEEC IPS Sub Committee
3. Current State of Industry Activities
  - a. SESAR Programs
  - b. ESA IRIS Precursor
  - c. FAA report on Safety / Hazard Assessment for DataComm, AeroMACS & SATCOM
  - d. EUROCAE Status
  - e. Any Other Activities
4. IPS Technical Discussions
  - a. Review of IPS RFC Profiles
    - i. RFC 791 – IP: LST & Honeywell
    - ii. RFC 2460 - IPv6: LST & Honeywell
    - iii. RFC 793 - TCP: Harris & Airtel ATN
    - iv. RFC 768 - UDP: MITRE
    - v. RFC 2474 – DS Field: LST
    - vi. Any other RFCs?
  - b. Prioritization of additional IETF RFCs for Profiling
5. Any Other Topics of Interest
6. Plans for Next Meetings
7. Review of Action Items and Meeting Summary
8. Adjourn

### **Agenda Items 1. Welcome, Introductions, Administrative Remarks**

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

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 – Rebecca Morrison and the Chair – Aloke Roy”

Brent Phillips also announced the RTCA Proprietary References Policy and Membership Policy.

**Agenda Item 2. Review of Current State of Industry Standards**

**2a. ICAO WG-I**

ICAO WG-I has been approved to begin IPS work and develop SARPS for IPS.

**2b. AEEC IPS Sub Committee**

AEEC IPS Sub Committee is continuing its Phase 1 effort to work on aircraft architecture and standardization roadmap for IPS. 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).

Figure 1 summarizes the IPS standardization plans of ICAO WG-I, RTCA SC-223 and AEEC IPS work group.




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

**Agenda Item 3. Current State of Industry Activities**

**3a. SESAR Programs**

The group chatted about what would be SESAR's plan for IPS implementation. Antonio Correias, Airtel ATN, said that the detailed SESAR plan for IPS may become clear by the end of this year.

### **3b. ESA IRIS Precursor**

As no Inmarsat representative attended the meeting, there was no update on ESA IRIS Precursor project.

### **3c. FAA report on Safety / Hazard Assessment for DataComm, AeroMACS & SATCOM**

David Robinson from FAA, Paul Mettus from LST, Bruce Eckstein from Harris and Dongsong Zeng from MITRE, suggested that DO-350A Baseline 2 Safety Performance Standard has the latest Safety / Hazard Assessment for DataComm. SC-223 can reference DO-350A for safety assessment and design assurance level determination until newer version Safety / Hazard Assessment for DataComm, AeroMACS & SATCOM comes out.

### **3d. EUROCAE Status**

Currently, EUROCAE plans to wait until AEEC IPS subcommittee completes its Phase 1 study on IPS architecture and standardization roadmap, and then decide whether to join SC-223 for IPS standard development.

### **3e. Any Other Activities**

The group reviewed and updated the status of action items from the previous meeting (see the updated List of Action Items in this report).

## **Agenda Item 4. IPS Technical Discussions**

### **4a. Review of IPS RFC Profiles**

Paul Mettus, LST and Alope Roy, Honeywell, provided draft profiles for IPv6 (RFC 2460), IPv4 (RFC791), and Differentiated Services (RFC2474). Bruce Eckstein, Harris, and Antonio Correias, Airtel ATN, provided draft profiles for TCP (RFCs 793, 1122, and 3168). Dongsong Zeng, MITRE, provided draft profile for UDP (RFC 768).

**Action Item P19-1:** All members review the draft RFC profiles and provide comments before next meeting.

Paul Mettus, LST, led the discussion and review of the draft IP profiles. During the discussion, the group decided that IPS will focus on IPv6 while providing accommodation to IPv4.

**Decision 1:** IPS will support IPv6, and accommodate IPv4.

Bruce Eckstein, Harris, and Antonio Correias, Airtel ATN, led the discussion and review of the draft profiles for TCP. In DO-345 AeroMACS Profile, devices are classified into two categories: Base Station and Mobile Station. In NIST IPv6 Profile, devices are classified into three categories: host, router, and Network Protection Device (NPD). In our draft IPS profiles for IP, TCP and UDP, we used two device classes: Air Entity and Ground Entity. The work group discussed the lack of consistency of device classes

across different standards, and decided to use five device classes, i.e., air host, ground host, air router, A/G router, and G/G router, in our initial IPS profiling.

**Decision 2:** Device classes: air host, ground host, air router (onboard aircraft), A/G router (on ground, interfacing directly with airborne host/router over RF media), G/G router (all routers on ground except A/G routers).

**Decision 3:** Stay in compliance with IETF and COTS implementation in general, unless the group decides otherwise.

#### **4b. Prioritization of additional IETF RFCs for Profiling**

Nima PourNejatian, WiMAX Forum, suggested that the work group should start with profiling IPv6 node first and then profiling individual RFCs. As RFC 6434 provides IPv6 node requirements, the group then looked into RFC6434. During the discussion of RFC6434, Madhu Niraula, Rockwell Collins, pointed out that DoD also published a document of IPv6 Standard Profiles for IPv6 Capable Products version 6.0, in July 2011 (disr\_ipv6\_profile\_version\_6\_july\_2011.pdf), which referenced the NIST Profile for IPv6 in the U.S. Government – version 1.0 (USGv6-v1.pdf). The work group agreed to give priority to identification of IPv6 functions and RFCs based on the latest DoD IPv6 profiles.

**Decision 4:** Develop higher level functional profile for IPv6 based on DOD IPv6 profile.

**Action Item P19-2:** Paul, Antonio, Madhu and Dongsong, identify IPv6 functions and corresponding RFCs, on the basis of the Appendix C: Requirements Summary Table in the file disr\_ipv6\_profile\_version\_6\_july\_2011.pdf, with consideration of NIST USGv6\_v1 document and RFC6434. Task group reports findings from DoD IPv6 Profile at the next telecon.

**Action Item P19-3:** Dongsong Zeng and Rebecca Morrison restructure the workspace to set up working folder and final folder.

The work group tasked Alope Roy and Brent Phillips to explore FTI documents on IPv6 profiles and test procedures, tasked Alope to develop ISRAs for potential special committees.

**Action Item P19-4:** Alope Roy and Brent Phillips explore FTI documents on IPv6 profiles and test procedures.

**Action Item P19-5:** Alope Roy develop ISRAs for potential special committees.

#### **Agenda Item 5. Any Other Topics of Interest**

No other topics of interest were raised during the meeting.

#### **Agenda Item 6. Plans for Next Meetings**

**Decision 5:** Next SC-223 meeting, November 8-10, 2016, at RTCA.

**Decision 6:** The meeting after next meeting is Feb. 28 - March 2, 2017, RTCA.

**Decision 7:** Monthly Subgroup telecons between meetings.

**Agenda Item 7. Review of Action Items and Meeting Summary**

Dongsong Zeng, MITRE, presented the out-briefing (SC-223 IPS Meeting OutBriefing\_08\_2016.pptx) which summarizes all the decisions and action items that were made in this meeting. The work group reviewed and agreed on all the decisions and action items recorded in the out-briefing.

**Agenda Item 8. Adjourn**

The meeting adjourned at noon, Friday, August 19, 2016.

**List of Action Items**

<b>Action Item #</b>	<b>Action Content</b>	<b>Responsible</b>	<b>Due Date</b>	<b>Status</b>
P18-1	Add ARINC658, DO-350a, DO-351a, DO-352a, and DO-353a to the initial documents in TOR	Aloke Roy	August 17, 2016	Open 8/2016 - Draft done, need to present to next PMC
P18-2	Inform us about SESAR IPS related projects	Antonio Correias	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 8/2016 - AeroMACS security was just completed, IPS security will leverage that later.
P18-4	Provide communication related system level safety analyses	Bruce Eckstein	August 17, 2016	Closed 8/2016 - Reference to DO-350a for operational safety analysis will satisfy the intent of this action item
P18-5	Conduct the safety analysis for IPS and provide the Design Assurance Level (DAL) for IPS	David Robinson	August 17, 2016	Open 8/2016 - Start with safety assessment, then decide DAL.
P18-6	Inform ICAO WG-I about ICAO Doc9896 Section 2.2 Link Layer Requirements, in	Aloke Roy	Next WG-I meeting	Open

	which interface requirements should not be local issues		in May 2016	8/2016 - Will be presented at December meeting
P18-7	Generate a work sheet of RFC list	Dongsong Zeng	August 17, 2016	Closed - 8/2016
P18-8	Check with SC-206 for the needs of IP services like FTP, Telnet, SNMP, etc.	Aloke Roy	August 17, 2016	Open 8/2016 - Will start a new ISRA with SC-206
P18-9	Check whether RFC 2488 Enhancing TCP over Satellite Channels is needed by IPS	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 8/2016 - On going
P18-11	Bring the TOR schedule modification request to next PMC for approval	Aloke Roy	Next PMC meeting in June 2016	Open 8/2016 – Will present to September meeting
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 8/2016 - On going
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 8/2016 - next WG-I meeting in December
P18-15	Coordinate with SC-222 about SATCOM providers' participation	Aloke Roy and David Robinson	August 17, 2016	Closed 8/2016 - Ann Heinke will participate SC-223
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	Closed - 8/2016
P18-17	Develop initial draft profile for RFC 768 User Datagram Protocol, August 1980	Dongsong Zeng	August 17, 2016	Closed - 8/2016
P18-18	Develop initial draft profile for RFC 791 Internet Protocol	Paul Mettus and Aloke Roy	August 17, 2016	Closed - 8/2016
P18-19	Develop initial draft profile for RFC 793 Transmission Control Protocol (TCP), September 1981	Bruce Eckstein and Antonio Correias	August 17, 2016	Closed - 8/2016
P19-1	Review the draft RFC profiles and provide comments before next meeting	All members	November 8, 2016	

P19-2	Identify IPv6 functions and corresponding RFCs, on the basis of the Appendix C: Requirements Summary Table in the file <code>disr_ipv6_profile_version_6_july_2011.pdf</code> , with consideration of NIST USGv6_v1 document and RFC6434. Task group reports findings from DoD IPv6 Profile at the next telecon.	Paul Mettus, Antonio Correas, Madhu Niraula, and Dongsong Zeng	November 8, 2016	
P19-3	Restructure the workspace to set up working folder and final folder	Dongsong Zeng and Rebecca Morrison	November 8, 2016	
P19-4	Explore FTI documents on IPv6 profiles and test procedures	Aloke Roy and Brent Phillips	November 8, 2016	
P19-5	Develop ISRAs for potential special committees	Aloke Roy	November 8, 2016	

-S-  
Dongsong Zeng  
Secretary

**CERTIFIED** as a true and accurate summary of the meeting.

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Aloke Roy  
Chairman