



RTCA Paper No. 009-20/SC-223-080

EUR 015-20 / WG108-23

Washington D.C. & Saint Denis, 21 January 2020

**MINUTES OF RTCA SC-223 (PLENARY #35) / EUROCAE  
WG-108 (MEETING #12) / JOINT MEETING #7**  
**“Internet Protocol Suite (IPS) and AeroMACS”**

<b>Date</b>	<b>December 9 – 13, 2019</b>
<b>Time</b>	<b>9:00am – 5:00pm, Monday – Thursday 9:00am – 12:00pm, Friday</b>
<b>Hosted by</b>	<b>EUROCONTROL</b>
<b>Venue</b>	96 Rue de la Fusée, 1130 Brussels, Belgium
<b>Contact</b>	<p><b>Liviu POPESCU</b>  Email: liviu.popescu@eurocontrol.int  Tel: +32 (0)2 729 3757</p> <p><b>Rebecca Morrison, Program Director, RTCA</b>  (202) 330-0654 or rmorrison@rtca.org</p> <p><b>Adrian Cioranu, Director Training and Communications, Technical  Program Manager, EUROCAE</b>  +33 1 49 46 19 72 or adrian.cioranu@eurocae.net</p>

Attendees:

<b>Name</b>	<b>Role</b>	<b>Affiliation</b>	<b>Note</b>
Andrea, Berti	Guest	Frequentis	
Bertoldi, Cristian	Guest	Airbus	
Cioranu, Adrian	Member	EUROCAE	
d'Humires, Francois	Member	FREQUENTIS A.G.	

Dlouhy, Ron	Member	Collins Aerospace	
Drasil, Pavel	Member	Honeywell International, Inc.	
Emberger, Luc	Guest	Airbus	
Graefe, Jonathan	Member	Collins Aerospace	
HAINDL, Bernhard	Member	FREQUENTIS A.G.	WebEx
Jain, Rovi	Guest	Federal Aviation Administration (FAA)	WebEx
Leonardon, Laurant	Guest	Collins Aerospace	
McParland, Tom	Guest	Basic Commerce and Industries, Inc	WebEx
Mineck, Kristen	Member	INMARSAT	
Morrison, Rebecca	Manager	RTCA, Inc.	
Niraula, Madhu	Member	Collins Aerospace	
Nisbet, David	Member	Thales Group	
Olive, Mike	Guest	Honeywell	
Pelleschi, Stephane	Member	Collins Aerospace	
Phillips, Brent	Government Authorized Representative	Federal Aviation Administration (FAA)	
Popescu, Liviu	Member	EUROCONTROL	
Pouzet, Jacky	Guest	EUROCONTROL	
Prisaznuk, Paul	Guest	SAE ITC, ARINC IA	
Robinson, David	Member	Iridium Satellite LLC	WebEx
Rossi, Nicolas	Member	Thales Group	
Roy, Alope	SC-223 Chair	Honeywell International, Inc.	
Saccone, Greg	Member	The Boeing Company	
Segers, Robert	Member	Federal Aviation Administration (FAA)	
Skorepa, Michael	Guest	Honeywell	
Tamalet, stÉphane	Member	Airbus	
Tran, Hoang	Guest	Federal Aviation Administration (FAA)	
Vanguardia, Michael	Member	The Boeing Company	
Weger, Roberto	Member	SITTI (EUROCAE)	
Zeng, Dongsong	SC-223 Secretary	The MITRE Corporation	

## AGENDA

1. Welcome, Introductions, EUROCAE and RTCA Policy Statements, Administrative Remarks
2. Review and approve the Agenda
3. Review of previous meeting notes and action items
4. Topics for Joint Meeting with AEEC Internet Protocol Suite (IPS) Subcommittee (Dec 10-11)
  - a. Standards Documents Intro - Purpose and Scope - SC Chairs
  - b. Standards Gap Analysis and Dependency Diagrams – Honeywell
  - c. Roadmap and schedule
  - d. Security and Key Management

- e. Mobility Management and Multilink
  - f. Naming and Address Resolution
  - g. Performance Requirements
  - h. Transition and Deployment Requirements
  - i. EUROCONTROL presentation on data link monitoring
5. Review of Current State of Industry Standards
    - a. ICAO WG-I
    - b. ICAO TFSG and GRAIN
  6. Current State of Activities
    - a. SESAR Presentation
    - b. ESA IRIS
    - c. Any Other Activities
  7. IPS MASPS Development
    - a. Security Risk Assessment
    - b. Robust header compression
    - c. CONOPS and Use Cases
    - d. OSED
    - e. SPR
  8. Any Other Topics of Interest
  9. Plans for Next Meetings
  10. Review of Action Items and Meeting Summary
  11. Adjourn when plenary business is complete

**Agenda Items 1. Welcome, Introductions, EUROCAE and RTCA Policy Statements, Administrative Remarks**

Aloke Roy, Chair of SC-223, Stephane Pelleschi, Chair of WG-108, Greg Saccone, Co-chair of AEEC IPS SC, and Luc Emberger, Co-chair of AEEC IPS SC welcomed the participants.

Rebecca Morrison, Program Director, RTCA, presented the RTCA/EUROCAE policy statements.

**Agenda Item 2. Review and approve the Agenda**

The group reviewed and approved the meeting agenda.

**Agenda Item 3. Review of previous meeting notes and action items**

The group approved the previous SC-223 P34 meeting minutes and updated the status of action items.

## **Agenda Item 4. Topics for Joint Meeting with AEEC Internet Protocol Suite (IPS) Subcommittee**

### **4a. Standard Documents Introduction - Purpose and Scope - SC Chairs**

The group went over the scope and dependencies of the IPS standards that each work group is developing to streamline the development efforts.

**Action Item P34-3:** Stephane Pelleschi to prepare slides for convergence of diagrams from different standards and present it to ICAO WG-I.

**Action Item P34-7:** Liviu Popescu to coordinate with Vaughn Maiolla on how ICAO standards should reference AEEC documents.

**Action Item P34-8:** Luc Emberger to present AEEC A/G management message section to ICAO.

### **4b. Standards Gap Analysis and Dependency Diagrams**

Mike Olive, Honeywell, presented the latest update to the ARINC658 IPS standardization and deployment gap analysis (see “A658-AppendixD\_IPS Gap Analysis Update\_20191211.xlsx” for more details).

Mike Olive, Honeywell, also presented a high-level document structure of ARINC858, which is shown in Figure 1.

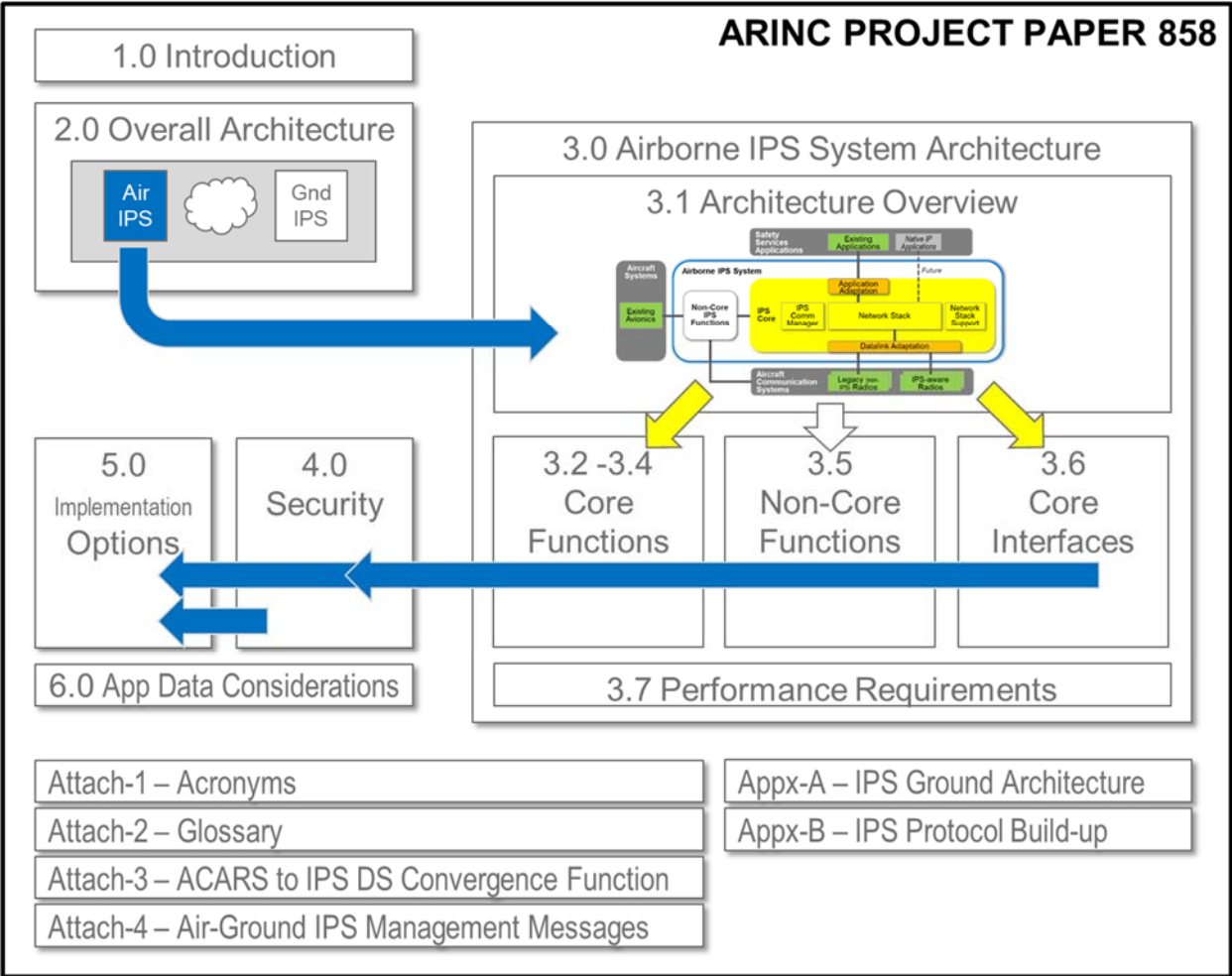


Figure 1. Interdependency and High-level document structure of ARINC858

**Action Item P34-4:** Dongsong Zeng to prepare a one-page summary of MASPS structure.

**4c. Roadmap and schedule**

To better facilitate the coordination between ICAO, RTCA/EUROCAE and AEEC, the next meeting will be joint SC-223 P36 / WG-108 / ICAO WG-I / AEEC IPS Subcommittee meeting, March 9-13, 2020, IATA, Montreal.

**4d. Security and Key Management**

The group agreed that the high-level requirements of IPS security and key management should be documented in ICAO DOCs. RTCA/EUROCAE standards will specify the minimum security requirements for avionics certification. AEEC standards will focus on implementation details.

**4e. Mobility Management and Multilink**

The group spent several hours discussing the IPS mobility and multilink. ICAO WG-I MSG will make the final decision on the solution of both mobility and multilink.

**Action Item P34-2:** Alope Roy to present MASPS multilink material to ICAO WG-I MSG in February 2020.

**Action Item P34-5:** Madhu Niraula to present a multilink paper to ICAO WG-I MSG.

#### **4f. Naming and Address Resolution**

The group discussed the IPS naming and address resolution. Collins Aerospace proposed a “simple name lookup” method for address resolution. However, Airbus believed that it is possible that aircraft carry all the IP addresses in a database, and address resolution mechanism can therefore be skipped.

#### **4g. Performance Requirements**

Alope Roy, Honeywell, raised a question on the current RCTP allocation specified in DO-350A and ICAO PBSC manual. He believes that the RCTP allocation to aircraft is too tight and plans to propose to increase the aircraft allocation in the coming ICAO OPLINK meetings.

#### **4h. Transition and Deployment Requirements**

**Action Item P34-6:** Madhu Niraula and Alope Roy to present DSCP QoS mapping to ICAO.

#### **4i. EUROCONTROL presentation on data link monitoring**

David Isaac, EUROCONTROL, presented an overview of European Data link Performance Monitoring. Figure 2 show the round-trip delay of CPDLC transactions over OSI/VDL2 network. The delay performance meets the 95-th percentile requirement but fails to meet the 99.9-th percentile requirement.

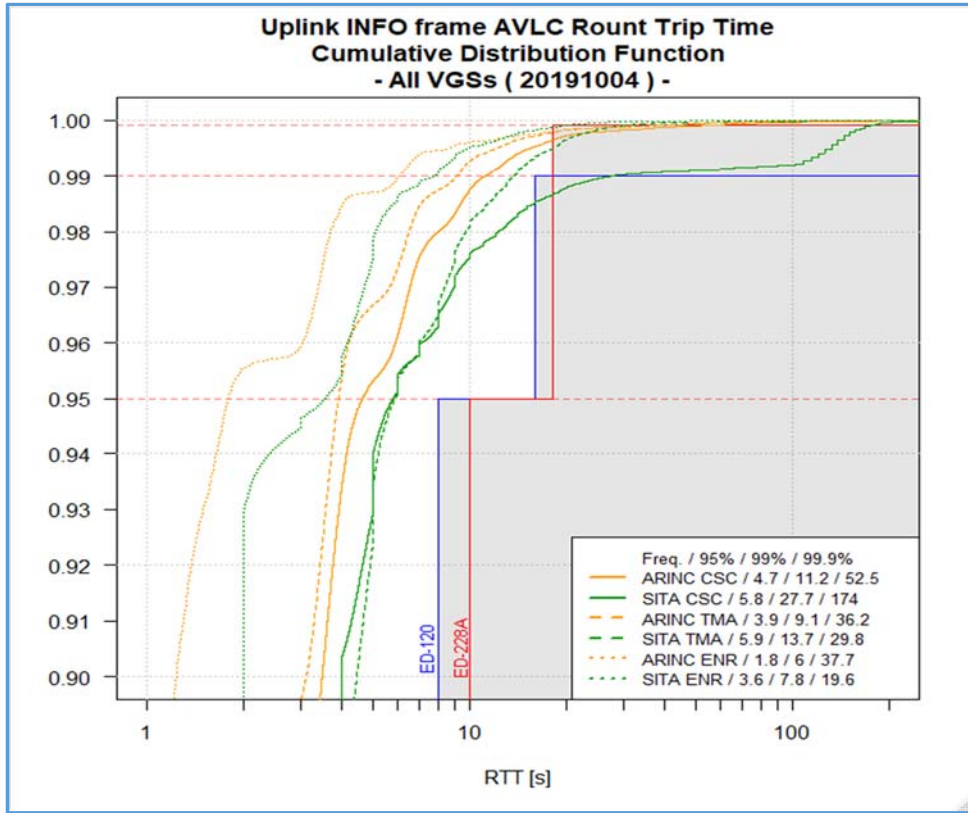


Figure 2. OSI/VDL2 Round-tip Technical Performance

Figure 3 shows the provider abort rate measurement results. In the last 12 months, the average provider abort rate is about 5% while the target provider abort rate is 1%.

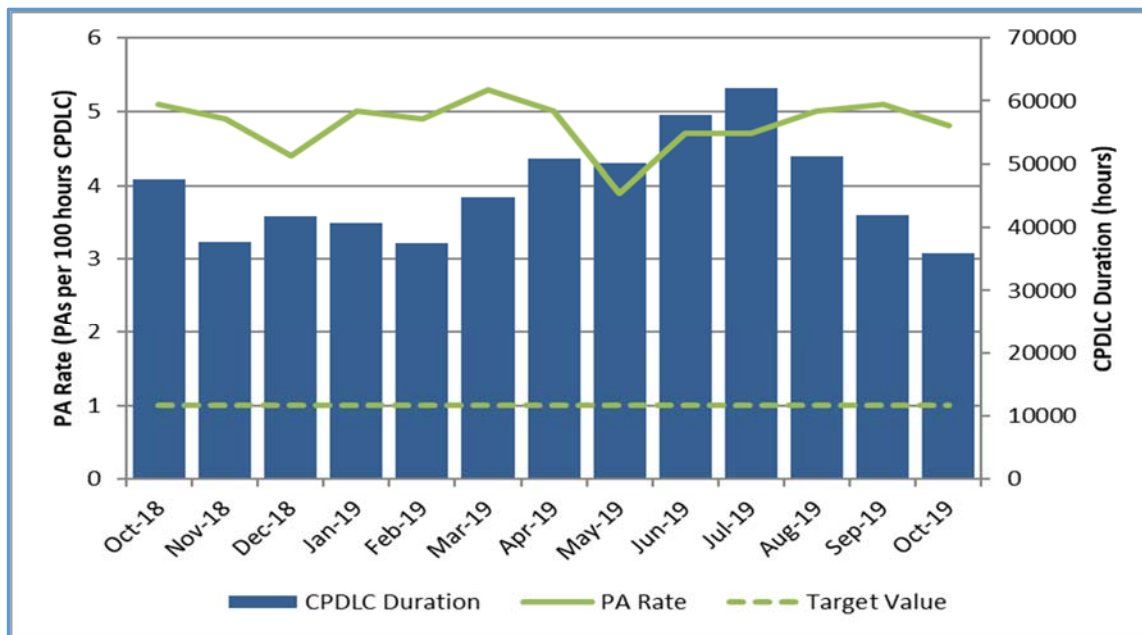


Figure 3. Average Provider Abort Rate over past 12 months

**Agenda Item 5. Review of Current State of Industry Standards**

**5a. ICAO WG-I**

Liviu Popescu, EUROCONTROL, presented the ICAO IPS SARPS and DOCs development schedule as shown in Figure 4 (see “WGI timeline Q3 2019 integrated.ppt” for more details).

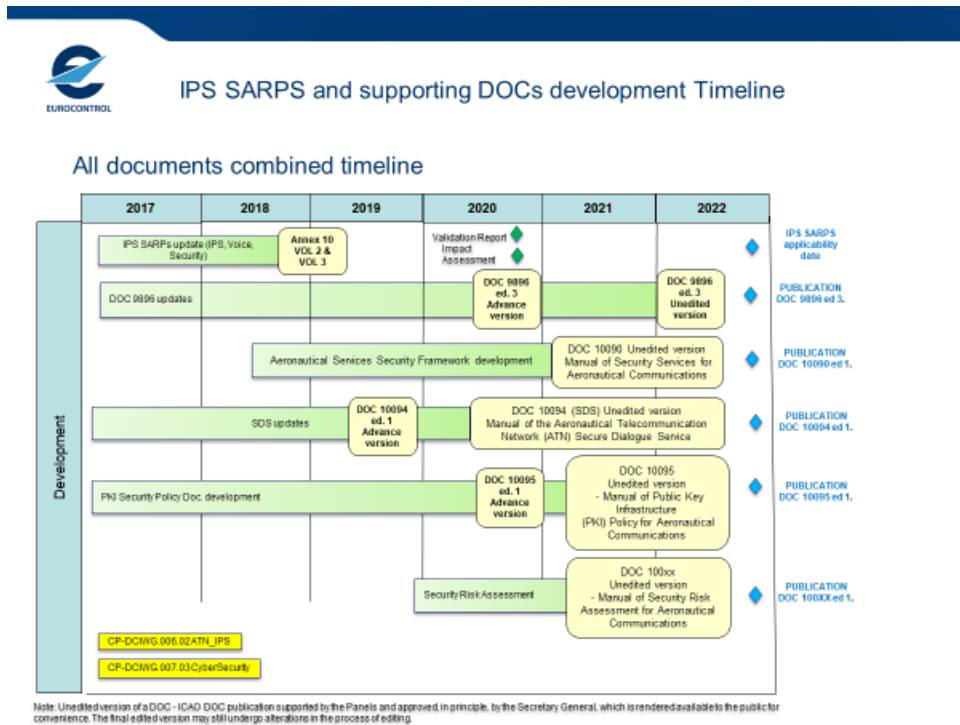


Figure 4. ICAO IPS SARPS and Supporting Docs Development Schedule

**5b. ICAO TFSG and GRAIN**

Robert Segers, FAA, updated the group on the latest activities and progress of ICAO TFSG and its GRAIN work group. The main objective of TFSG is to establish an international aviation trust framework. TFSG is also responsible of the attainment of the aviation IPv6 address allocation and port number reservation.

Aloke Roy, Honeywell, proposed an IPv6 address format (see “IPv6-Addressing-Framework-Dec2019.pdf” for more details.). The group discussed the proposal and provided suggestions for modification.

**Agenda Item 6. Current State of Activities**



## **6a. SESAR Presentation**

François d'Humières, Frequentis, updated the group on the status of SESAR project and presented the SESAR2020 PJ14.02.04 Final Technical Specification of Wave 1.

The document will not be available to the group until the European Commission approves its public release probably in January 2020.

The group also exchanged on the performance results presented in September 2019 and the limitations of the Wave 1 validation platform.

**Action Item P34-9:** Francois d'Humieres to provide feedbacks to SESAR Wave 2 program recommending align SESAR performance measurements to the architecture that the standard groups are developing.

## **6b. ESA IRIS**

Kristen Mineck, Inmarsat, briefly talked about the status of ESA IRIS program.

## **6c. Any Other Activities**

No other activities were reported.

## **Agenda Item 7. IPS MASPS Development**

### **7a. Security Risk Assessment**

Mike Vanguardia, Boeing, presented a draft scope of IPS airworthiness security.

**Action Item P34-1:** Mike Vanguardia to talk to Isidore Venetos on IPS SRA by Q2 2020.

### **7b. Robust header compression**

Pavel Drášil and Martin Henzl, Honeywell, presented an information paper titled "ROHC in IPS," and suggested that ROHC should not be required by IPS. The group discussed and agreed on the suggestion.

**Decision 1:** The group decided to propose to remove ROHC requirement from IPS standards.

Note: After the meeting, in the group telecon in January, this decision was discussed. Jonathan Graefe took an action item to investigate the issue and come back with more inputs.

### **7c. CONOPS and Use Cases**

#### **7d. OSED**

#### **7e. SPR**

The group briefly talked about CONOPS, OSED and SPR.

Stéphane Tamalet, Airbus, presented slides on how to describe the expected services and associated requirements from the ATN B2 SPRs. The group discussed the expected level of requirements that are

required for the ATN/IPS MASPs and how to allocate them to each of the systems involved (Avionics, Ground Providers, ANSPs, Airlines...). Stéphane Tamalet also presented an input paper on IPS performance requirements, based on the SATCOM MASPS approach, for consideration of incorporation to the MASPS.

Stephane Pelleschi, Collins Aerospace, presented slides on a notional IPS architecture and an example of sequence diagram. The group reviewed and provided suggestions for Stephane Pelleschi to improve and re-discuss the updated version in next meeting.

**Agenda Item 8. Any Other Topics of Interest**

No other topics of interest were brought up during the meeting.

**Agenda Item 9. Plans for Next Meetings**

- Joint SC-223 P36 / WG-108 / ICAO WG-I / AEEC IPS Subcommittee meeting, March 9-13, 2020, IATA, Montreal.
- Joint SC-223 P37 / WG-108, June 23-26, 2020, Brno, Czech Republic.

**Agenda Item 11. Review of Action Items and Meeting Summary**

Dongsong Zeng, MITRE, presented an out-briefing, which summarizes the decisions and action items that were made during this meeting. The work group reviewed and agreed on the out-briefing (see SC-223 P35\_WG-108 Meeting OutBriefing\_Dec\_2019.pptx).

**Agenda Item 12. Adjourn when plenary business is complete**

The meeting adjourned around 5:00 PM, December 12, 2019.

**List of Action Items**

Action Item #	Action Content	Responsible	Due Date	Status
P23-7	Investigate the CRCs of ROHC at system level.	Aloke Roy	October 23, 2017	10/23/2017 – In progress 12/4/17 – Keep open 3/5/18 – keep open 6/4/18 – keep open 8/13/18 – keep open. 9/24/18 – keep open. 12/10/2018 – postponed to MASP discussion 3/25/2019 – keep it open 6/17/2019 – keep open 9/30/2019 – keep open 12/9/2019 – Review Pavel’s paper
P29-2	Reach out to SC-228 to verify whether IPS will be used by C2 link	Aloke Roy	Dec. 3, 2018	12/10/2018 – done. The dependency is still to be defined. 3/25/2019 – keep it open. 6/17/2019 – keep open

				9/30/2019 – Closed. Yes. IPS is recommended by SC-228 for C2 Link BLOS use cases. Any potential extensions by WG-105 will be on case on case basis.
P32-1	Update the Profile to include all FRAC/OC resolutions and Rebecca to distribute the file to the group	Dongsong Zeng	April 8, 2019	4/24/2019 – Done and closed
P32-2	Work out a consented resolution on row reduction in Appendix B-6 RFC 2597 detailed profile	Aloke Roy and Stephane Tamalet	April 1, 2019	4/24/2019 – Done and closed
P32-3	Review the updated Profile to make sure all FRAC/OC resolutions are correctly executed	All members	April 1, 2019	4/24/2019 – Done and closed
P32-4	Update the MASPS schedule and draft corresponding TOR revision	Stephane Pelleschi and Aloke Roy	June 17, 2019	6/17/2019 – keep open 9/30/2019 – Done. The TOR has been approved by PMC and TAC.
P32-5	Put SC-223/WG-108 TOR approval on the agenda of next meeting	Dongsong Zeng	June 17, 2019	6/17/2019 – Done and closed.
P32-6	Resolve Alistair's comment	Aloke Roy	April 1, 2019	4/24/2019 – Done and closed
P32-7	Members who were assigned to work on specific MASPS sessions will start to develop the corresponding MASPS annexes	Assigned Members	June 17, 2019	6/17/2019 – keep open 12/9/2019 – keep open
P33-1	Update IPS MASPS development schedule.	Dongsong Zeng	Sept. 30, 2019	7/17/2019 – Done.
P33-2	Schedule a telecon to advance IPS security risk assessment.	Madhu Niraula	Sept. 30, 2019	9/30/2019 – Closed. Vic Patel will lead this activity. A telecon with ICAO WG-I SSG is planned on Nov 8, 10AM EST.
P33-3	Coordinate with EASA for participation in SC-223/WG-108 P39 December 2020 meeting for FRAC/OC resolution.	Stephane Pelleschi and Adrian Cioranu	Sept. 30, 2019	9/30/2019 – keep open. 12/9/2019 – keep open
P33-4	Present DNS concept to ICAO WG-I.	Madhu Niraula	Sept. 30, 2019	9/30/2019 – keep open. In progress. 12/9/2019 – keep open
P33-5	Consolidate inputs to the MASPS moving work-in-progress materials into annexes	Stephane Pelleschi	Sept. 30, 2019	9/30/2019 – Done.
P33-6	Present Collins' multilink concept to the next ICAO WG-I in September 2019.	Madhu Niraula	Sept. 30, 2019	9/30/2019 – keep open. 12/9/2019 – keep open
P34-1	Provide an initial MASPS authors list based on SC-223 roster and the group will review and determine the final authors list at the end of the work.	Rebecca Morrison	Dec. 9, 2019	12/9/2019 – Closed and subject to review.
P34-2	Provide instructions of change proposals on the Profile standard.	Rebecca Morrison	Dec. 9, 2019	12/9/2019 – Closed and subject to review.
P34-3	Initiate ISRA between SC-222 and SC-223.	Aloke Roy and David Robinson	Dec. 9, 2019	12/9/2019 – Closed. ISRA drafted by SC-223, but rejected by SC-222. SC-222 will not be able to do anything until August.
P34-4	Coordinate with SC-214 on ISRA between SC-214 and SC-223.	Aloke Roy	Dec. 9, 2019	12/9/2019 – Closed. SC-214 is working to support IPS and no ISRA is needed right now.

P34-5	Coordinate with RTCA WAIC on aviation IPv6 address.	Rebecca Morrison and Alope Roy	Dec. 9, 2019	12/9/2019 – keep open.
P34-6	Update IPv6 address format paper, changing platform type to type, changing type bits from 2 to 4, changing subnet ID to 10 bits.	Alope Roy	Dec. 9, 2019	12/9/2019 – Closed and subject to review.
P34-7	Identify the process of administration and maintenance of IPv6 addresses.	Alope Roy	Dec. 9, 2019	12/9/2019 – keep open. Also within the purview of ICAO TFSG/GRAIN.
P34-8	Work with PMC to create a special workspace for security information papers storage.	Alope Roy	Dec. 9, 2019	12/9/2019 – Closed. Security information repository has been decided to move to ICAO.
P34-9	Complete the assigned MASPS sections by next meeting, as assigned in the MASPS progress spreadsheet.	All members	Dec. 9, 2019	12/9/2019 – keep open.
P34-10	Bring IPS transition and deployment strategy to ICAO DCIWG and request feedbacks from stakeholders of member states.	Alope Roy and Liviu Popescu	Dec. 9, 2019	12/9/2019 – Closed. Waiting for ICAO action for feedbacks from member states.
P35-1	Talk to Isidore Venetos on IPS SRA by Q2 2020.	Mike Vanguardia	March 9, 2020	
P35-2	Present MASPS multilink material to ICAO WG-I MSG in February 2020.	Alope Roy	March 9, 2020	
P35-3	Prepare slides for convergence of diagrams from different standards and present it to ICAO WG-I.	Stephane Pelleschi	March 9, 2020	
P35-4	Prepare a one-page summary of MASPS structure.	Dongsong Zeng	March 9, 2020	
P35-5	Present a multilink paper to ICAO WG-I MSG.	Madhu Niraula	March 9, 2020	
P35-6	Present DSCP QoS mapping to ICAO.	Madhu Niraula and Alope Roy	March 9, 2020	
P35-7	Coordinate with Vaughn Maiolla on how ICAO standards should reference AEEC documents.	Liviu Popescu	March 9, 2020	
P35-8	Present AEEC A/G management message section to ICAO.	Luc Emberger	March 9, 2020	
P35-9	Provide the group feedbacks to SESAR Wave 2 validation recommending align SESAR performance measurements to the architecture that the standard groups are developing.	Francois d'Humieres	March 9, 2020	

Dongsong Zeng  
Secretary

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

- S-  
Aloke Roy  
SC-223 Chairman

- S-  
Stephane Pelleschi  
WG-108 Chairman