



RTCA Paper No. 067-21/SC223-104

EUR 96-21 / WG108-31

Washington D.C. & Saint Denis, 12 March 2021

**MINUTES OF JOINT RTCA SC-223 (PLENARY #42) /
EUROCAE WG-108 (MEETING #17) / JOINT MEETING #11**
“Internet Protocol Suite (IPS) and AeroMACS”

Date	March 1 - 4, 2021
Time	10am – 3pm EST, 16h-21h CET, 7am-noon PST Monday – Thursday
Hosted by	Virtual Meeting
Venue	For Webex, Contact Rebecca or Anna
Contact	Rebecca Morrison , Program Director, RTCA (202) 330-0654 or rmorrison@rtca.org Anna von Groote , Technical Programme Manager, EUROCAE +33 1 49 46 19 71 or anna.vongroote@eurocae.net

Attendees:

Name	Role	Affiliation
d'Humieres, Francois	Member	FREQUENTIS A.G.
Dlouhy, Ron	Member	COLLINS AEROSPACE
Drasil, Pavel	Member	HONEYWELL INTERNATIONAL, INC.
Graefe, Jonathan	Member	COLLINS AEROSPACE
Grafu, Florin	Observer	ROMATSA

Haindl, Bernhard	Member	FREQUENTIS A.G.
Jaron, Zdenek	Member	HONEYWELL INTERNATIONAL, INC.
Kilbourne, Todd	Member	MOSAIC ATM, INC.
Lardon, Daniel	Member	THE BOEING COMPANY
Leonardon, Laurent	Guest	COLLINS AEROSPACE
Morrison, Rebecca	Program Director	RTCA, INC.
Niraula, Madhu	Member	COLLINS AEROSPACE
Nisbet, David	Member	THALES GROUP
Nguyen, Lee	Member	FEDERAL AVIATION ADMINISTRATION (FAA)
Pelleschi, Stephane	WG-108 Chair	COLLINS AEROSPACE
Phillips, Brent	Government Authorized Representative	FEDERAL AVIATION ADMINISTRATION (FAA)
Popescu, Liviu	Member	EUROCONTROL
Roy, Alope	SC-223 Chair	HONEYWELL INTERNATIONAL, INC.
Saccone, Greg	Member	THE BOEING COMPANY
Segers, Robert	Member	FEDERAL AVIATION ADMINISTRATION (FAA)
Soléry, Michel	Member	DSNA
Tamalet, Stephane	Member	AIRBUS
Varkonyi, Bela	Member	FREQUENTIS A.G.
Von Groote, Anna	Technical Programme Manager	EUROCAE
Warns, Timo	Member	AIRBUS
Zeng, Dongsong	SC-223 Secretary	THE MITRE CORPORATION

AGENDA

1. Welcome address. Meeting Organizational Issues
2. Administrative Remarks
3. Approval of the Agenda
4. Review and Approval of Previous Meeting Notes
5. Current State of Standards
 - a. ICAO WG-I (ICAO Annex 10, DOC 9896 ed 3, DOC 10090, DOC 10094, DOC 10095, DOC 10145)
 - b. AEEC A858
 - c. ICAO TFSG
 - d. Other Relevant Standards
6. Current State of Industry Activities
 - a. SESAR
 - b. ESA IRIS

- c. Feedback on ICCAIA / Cyber-CAT Risk Assessment
 - d. Any Other Relevant Activities
7. Review SC-223/WG-108 Terms of Reference
8. IPS MASPS Development
 - a. MASPS Development Progress Overview (Security on Wednesday morning)
 - b. MASPS Discussion
9. Future Meetings
10. Any Other Business of Interest
11. Review of Meeting Decisions and Actions
12. Adjourn

Agenda Items 1. Welcome address. Meeting Organizational Issues

Aloke Roy, Chair of SC-223, and Stephane Pelleschi, Chair of WG-108, welcomed the participants.

Agenda Item 2. Administrative Aspects

Rebecca Morrison, Program Director, RTCA, presented the RTCA/EUROCAE antitrust, proprietary and membership policy statements. All participants agreed on the statements and no issues were raised.

Agenda Item 3. Approval of the Agenda

The group reviewed and approved the meeting agenda.

Agenda Item 4. Review and Approval of Previous Meeting Notes

The group reviewed and approved the previous meeting notes.

Agenda Item 5. Current State of Standards

5a. ICAO WG-I (ICAO Annex 10, DOC 9896 ed 3, DOC 10090, DOC 10094, DOC 10095, DOC 10145)

Liviu Popescu, EUROCONTROL, briefed the group on the schedule of ICAO IPS standards development, which is shown in Figure 1.

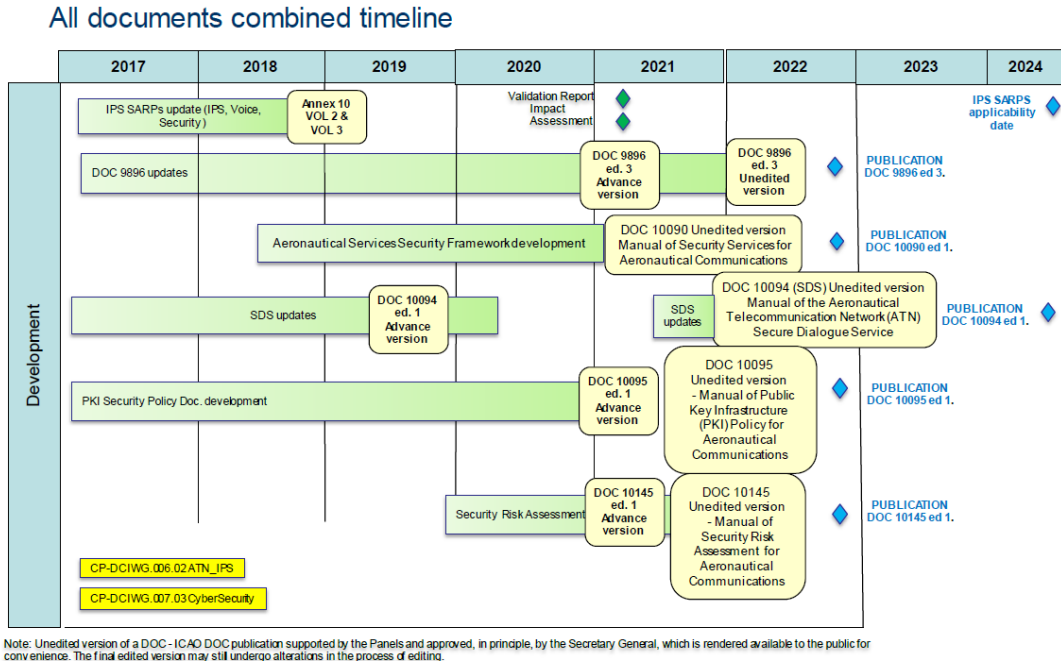


Figure 1. ICAO IPS SARPs and Docs Timeline

5b. ARINC858

Greg Saccone, The Boeing Company, and Mike Olive, Honeywell, updated the group about AEEC IPS Standards development schedule, which is shown in Figure 2.

ATN/IPS A/G Standardization Roadmap (rev. 2020-10-01a)

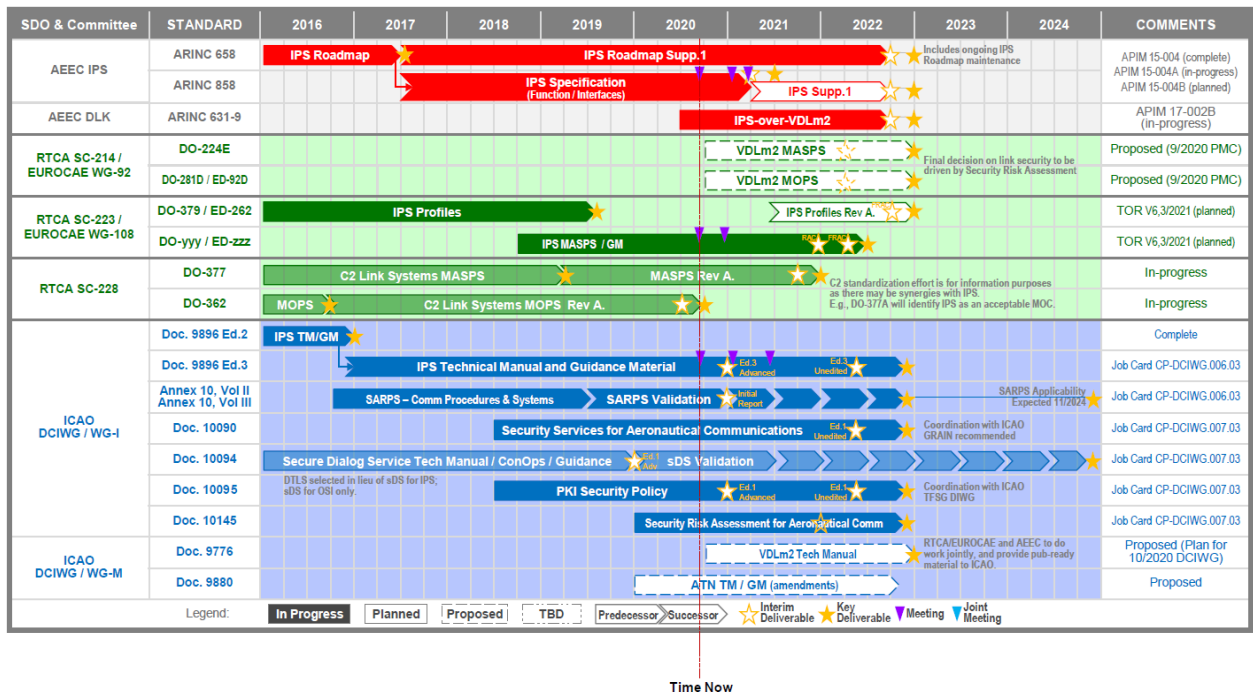


Figure 2. AEEC IPS A/G Standardization Roadmap

5c. ICAO TFSG

Jonathan Graefe, Collins Aerospace IMS, updated ICAO TFSG status. ICAO TFSG is progressing as planned on governance policies, identity concepts and aviation IPv6 address preservation and management. The next TFSG meeting is on April 19, 2021.

5d. Other Relevant Standards

Lee Nguyen, FAA, updated the group about SC-228 UAS C2 Link standards activities. Currently SC-228 plans to update UAS C2 Link System MASPS DO-377B Appendix K, Interworking Assessment and Considerations for C2 Link System Connection, Switchover, and Control station Handover, and Appendix L, C2 Link System Security Considerations, to include the latest IPS standard advances from RTCA SC-223 / EUROCAE WG-108 (IPS), ICAO WG-I (Interworking), and AEEC Subcommittee (Internet Protocol Suite (IPS) for Aeronautical Safety):

- Application of Network layer mobility management (SC-223/WG-108 MASPS and AEEC A858) to C2 Link Switchovers and Control Station Handovers. Update/improve DO-377A C2 Link Route Switchovers, and CS Handovers to include features from SC-223/WG-108 and AEEC A858 developed standards, as appropriate.
- IPv6 Addressing alignment with ICAO addressing framework.

Stephane Pelleschi and Dongsong Zeng reported that SC-214/WG-92/DLK are jointly developing revisions to VDL2 standards to improve the VDL2 performance in accordance with operational feedbacks and to support the emerging IPS network. It was recognized that the VDL2 security requirement is

dependent on the IPS security risk assessment. Currently SC-214/WG-92/DLK assume VDL2 subnetwork security is required, but this assumption needs to be confirmed by IPS standard committees.

Aloke Roy will coordinate with RTCA to find out whether an ISRA between SC-223 and SC-214 is needed.

Agenda Item 7. Current State of Industry Activities

7a. SESAR

Francois d'Humieres, Frequentis, presented the final report of SESAR2020 FCI study, titled “SESAR 2020 PJ.14-W2-77 TRL6 Overall Concept of Operation FCI Services.” The report is a comprehensive study of IPS operations in view of European Future Communication Infrastructure deployment, which has been made available for SC-223/WG-108 members to peruse.

7b. ESA IRIS

No update on ESA IRIS was received during the meeting.

7c. Feedback on ICCAIA / Cyber-safety CAT Risk Assessment

CSCAT plans to provide its interim risk assessment of IPS to WG-I in January 2021 after an internal review process.

7d. Any Other Relevant Activities

No other relevant activities were reported.

Agenda Item 8. IPS MASPS Development

Aloke Roy, Honeywell, presented the following two papers:

“IPS Multilink Overview,” and

“IPS Standards Guidance for Implementers.”

Stephane Tamalet, Airbus, presented an information paper on safety requirements and safety management.

Dongsong Zeng, MITRE, presented an information paper, titled “IPS Safety Requirements.”

Stephane Pelleschi and Jonathan Graefe, Collins Aerospace, presented an information paper titled “RCTPcsp Allocation.”

Greg Saccone, Boeing, presented his inputs to MASPS Section 1.

Timo Warns, Airbus, provided a draft outline of MASPS Security Requirements section.

Madhu Niraula and Ron Dlouhy, Collins Aerospace, presented their inputs to MASPS Section 4.1.3.

Stephane Pelleschi, Collins Aerospace, put all inputs from the group into the repository file of IPS MASPS.

During the meeting, the following decision was made, and action items were assigned.

Decision 1. Madhu Niraula is assigned as the editor of DO-379A.

Action 1. Stephane Pelleschi to review FCI report and extract additional IPS requirements if necessary.

Action 2. Madhu Niraula to find out potential DO-379 changes including previous FRAC comments.

Action 3. Dongsong Zeng to find out the operational possibility of encryption of ATC messages.

Action 4. Bela Varkonyi to craft a whitepaper on RCTP measurement options and potential issues on intermediate nodes.

Action 5. All members to explore possibilities for performance measurement.

Action 6. Stephane Pelleschi to maintain progress sheet, update MASPS and track actions within MASPS.

Agenda Item 9. Future Meetings

SC-223 P43 / WG-108, June 14 - 17, 2021, Virtual.

SC-223 P44 / WG-108, September 27 – October 1, 2021, TBD (piggybacking with ICAO WG-I meeting in Montreal, alternatively at RTCA).

Monthly working telecons

- 10:00 am – 12:00 pm EST, March 24, 2021
- 10:00 am – 12:00 pm EST, April 28, 2021
- 10:00 am – 12:00 pm EST, May 26, 2021

Agenda Item 10. Any Other Business

No other businesses were brought up during the meeting.

Agenda Item 11. Review of Meeting Decisions and Actions

The group reviewed the decisions made and actions created during the meeting.

Agenda Item 12. Adjourn

The meeting was adjourned around 12:00pm EST, March 4, 2021.

List of Action Items

Action Item #	Action Content	Responsible	Due Date	Status
P23-7	Investigate the integrity of IPS (w/ or w/o 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 2/26/2020 – keep open 5/27/2020 – keep open 9/28/2020 – Closed. Use 3-bit CRC for header integrity. Additional CRC doesn’t add much more integrity beyond what is provided by DTLS.
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-by-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 2/26/2020 – keep open 5/27/2020 – Closed

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 Anna Von Groote	Sept. 30, 2019	9/30/2019 – keep open. 12/9/2019 – keep open 2/26/2020 – keep open 5/27/2020 – keep open 9/28/2020 – keep open 12/7/2020 – keep open 3/1/2021 – 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 2/26/2020 – keep open 5/27/2020 – keep open 9/28/2020 – keep open 12/7/2020 – keep open 3/1/2021 – 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 and Dongsong Zeng	Sept. 30, 2019	9/30/2019 – keep open. 12/9/2019 – keep open 2/26/2020 – Closed
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 Aloke Roy	Dec. 9, 2019	12/9/2019 – keep open. 2/26/2020 – keep open 5/27/2020 – keep open 9/28/2020 – Closed. Coordinated with WAIC chair. They don’t have a need for IPv6 address so far.
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.	Aloke Roy	Dec. 9, 2019	12/9/2019 – Closed and subject to review.
P34-7	Identify the process of administration and maintenance of IPv6 addresses.	Aloke Roy	Dec. 9, 2019	12/9/2019 – keep open. Also, within the purview of ICAO TFSG/GRAIN. 2/26/2020 – keep open

				5/27/2020 – keep open 9/28/2020 – keep open 12/7/2020 – Closed. Paper submitted.
P34-8	Work with PMC to create a special workspace for security information papers storage.	Aloke 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. 2/26/2020 – keep open 5/27/2020 – keep open 9/28/2020 - keep open 12/7/2020 – Closed.
P34-10	Bring IPS transition and deployment strategy to ICAO DCIWG and request feedbacks from stakeholders of member states.	Aloke 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	2/26/2020 – keep open. Expect an initial draft SRA from Isidore by June 2020 5/27/2020 – keep open 9/28/2020 – Closed. Coordination is going on among CSCAT and other related parties.
P35-2	Present MASPS multilink material to ICAO WG-I MSG in February 2020.	Aloke Roy	March 9, 2020	2/26/2020 – keep open 5/27/2020 – keep open 9/28/2020 – keep open 12/7/2020 – keep open 3/1/2021 – Closed. Inputs provided to SC-223.
P35-3	Prepare slides for convergence of diagrams from different standards and present it to ICAO WG-I.	Stephane Pelleschi	March 9, 2020	2/26/2020 – keep open 5/27/2020 – keep open 9/28/2020 – Closed.
P35-4	Prepare a one-page summary of MASPS structure.	Dongsong Zeng	March 9, 2020	2/26/2020 – Closed. Subject to review
P35-5	Present a multilink paper to ICAO WG-I MSG.	Madhu Niraula and Dongsong Zeng	March 9, 2020	2/26/2020 – keep open 5/27/2020 – Closed
P35-6	Present DSCP QoS mapping to ICAO.	Madhu Niraula and Aloke Roy	March 9, 2020	2/26/2020 – keep open 5/27/2020 – keep open 9/28/2020 – Closed
P35-7	Coordinate with Vaughn Maiolla on how ICAO standards should reference AEEC documents.	Liviu Popescu	March 9, 2020	2/26/2020 – keep open 5/27/2020 – Closed
P35-8	Present AEEC A/G management message section to ICAO.	Madhu Niraula	March 9, 2020	2/26/2020 – keep open 5/27/2020 – keep open 9/28/2020 – keep open 12/7/2020 – keep open 3/1/2021 – Closed.
P35-9	Provide the group feedbacks to SESAR Wave 2 validation recommending align	Francois d’Humieres	March 9, 2020	2/26/2020 – Closed. Action completed.

	SESAR performance measurements to the architecture that the standard groups are developing.			
P37-1	Present the QoS paper to ICAO WG-I meeting.	Madhu Niraula and Alope Roy	Sept. 28, 2020	9/28/2020 – Closed
P37-2	Update the verification paper and send it the industry editor for inclusion to the MASPS draft.	Dongsong Zeng	Sept. 28, 2020	9/28/2020 – Closed
P37-1	Present the QoS paper to ICAO WG-I meeting.	Madhu Niraula and Alope Roy	Sept. 28, 2020	9/28/2020 – keep open 12/7/2020 – Closed.
P37-2	Update the verification paper and send it the industry editor for inclusion to the MASPS draft.	Dongsong Zeng	Sept. 28, 2020	9/28/2020 - Closed.
P37-3	Estimate of line of code for ROHC	Pavel Drasil	Sept. 28, 2020	9/28/2020 - Closed.
P37-4	Provide details on how the ROHC analysis was done	Pavel Drasil	Sept. 28, 2020	9/28/2020 - Closed.
P37-5	Assess whether ROHC at DAL C is reasonably achievable	Collins Aerospace	Sept. 28, 2020	9/28/2020 – keep open 12/7/2020 – keep open 3/1/2021 – keep open. Note: ROHC is optional for UAS C2Link according to DO-377A.
P37-6	Evaluate the impacts of splitting data flows among multiple links with performance-based multilink on ROHC performance	Jon	Sept. 28, 2020	9/28/2020 – keep open 12/7/2020 – keep open 3/1/2021 – keep open.
P38-1	Maintain a MASPS action item list.	Stephane Pelleschi	Nov. 16, 2020	12/7/2020 – Closed.
P38-2	Stephane Pelleschi to reach out to Airbus and Alope Roy to reach out to Boeing for co-task-leads of the security task group.	Stephane Pelleschi, Alope Roy	Nov. 16, 2020	12/7/2020 – Closed.
P38-3	Update the IP address paper according to comments received in this meeting	Alope Roy	Nov. 16, 2020	12/7/2020 – Closed. Done.
P41-1	Coordinate with Ravi Jain on Security Management and identity assurance.	Alope Roy	Feb. 22, 2021	3/1/2021 – keep open.
P41-2	Write a standard flow-down chart for MASPS.	Liviu Popescu and Alope Roy	Feb. 22, 2021	3/1/2021 – Closed.
P41-3	Review Stephane Tamalet’s input papers on safety requirements and provide feedback on what should be covered in MASPS.	All members	Feb. 22, 2021	3/1/2021 – Closed.
P41-4	Provide FAA generic papers related to aircraft level security assessment.	Madhu Niraula and Lee Nguyen	Feb. 22, 2021	3/1/2021 – Closed. Inputs provided.
P41-5	Provide draft latency allocations for RCTPcsp based on the discussion in the meeting.	Stephane Pelleschi and	Feb. 22, 2021	3/1/2021 – Closed. Inputs are subject to group review.

		Madhu Niraula		
P41-6	Provide a draft outline of security section in MASPS.	Timo Warns	Feb. 22, 2021	3/1/2021 – Closed.
P41-7	Follow up with OPLINK people on PBCS status.	Brent Phillips	Feb. 22, 2021	3/1/2021 – Closed. Coordination is ongoing. Multiple meetings with action plan.
P41-8	Make sure RCP requirements are adequate for existing/future data services and what RCTP and SLA requirements are used for CSPs.	Brent Phillips, Dongsong Zeng, Pete Muraca, Alope Roy	Feb. 22, 2021	3/1/2021 – keep open. Still need to address operational issues such as security and multilink.
P41-9	Review ITU-T Y.1542 for performance allocation.	All members	Feb. 22, 2021	3/1/2021 – Closed.
P41-10	Update the CONOPS and bring in C2Link requirements for group consideration.	Alope Roy	Feb. 22, 2021	3/1/2021 – keep open.
P41-11	Identify MASPS topics for next telecon and remind action owners of their actions.	Stephane Pelleschi	Feb. 22, 2021	3/1/2021 – Closed.
P42-1	Review FCI report and extract additional IPS requirements if necessary.	Stephane Pelleschi	June 7, 2021	
P42-2	Find out potential DO-379 changes including previous FRAC comments.	Madhu Niraula	June 7, 2021	
P42-3	Find out the operational possibility of encryption of ATC messages.	Dongsong Zeng	June 7, 2021	
P42-4	Craft a whitepaper on RCTP measurement options and potential issues on intermediate nodes.	Bela Varkonyi	June 7, 2021	
P42-5	Explore possibilities for performance measurement.	All members	June 7, 2021	
P42-6	Maintain progress sheet, update MASPS and track actions within MASPS.	Stephane Pelleschi	June 7, 2021	

-S-
Dongsong Zeng
Secretary

CERTIFIED as a true and accurate summary of the meeting.

- S-
Alope Roy
SC-223 Chairman

- S-
Stephane Pelleschi
WG-108 Chairman