



RTCA Paper No. 004-21/SC223-102

EUR 002-21 / WG108-30

Washington D.C. & Saint Denis, 5 January 2021

MINUTES OF JOINT RTCA SC-223 (PLENARY #41) /
EUROCAE WG-108 (MEETING #16) / JOINT MEETING #10
“Internet Protocol Suite (IPS) and AeroMACS”

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| Date | December 7-10, 2020 |
| Time | 10am – 3pm EST, 16h-21h CET, 7am-noon PST Monday – Thursday |
| Hosted by | Virtual Meeting |
| Venue | For Webex, Contact Rebecca or Anna |
| Contact | <p>Rebecca Morrison, Program Director, RTCA (202) 330-0654 or rmorrison@rtca.org</p> <p>Anna von Groote, Technical Programme Manager, EUROCAE +33 1 49 46 19 71 or anna.vongroote@eurocae.net</p> |

Attendees:

| Name | Role | Affiliation |
|----------------------|-------------|-------------------------------|
| d'Humieres, Francois | Member | FREQUENTIS A.G. |
| Dlouhy, Ron | Member | COLLINS AEROSPACE |
| Drasil, Pavel | Member | HONEYWELL INTERNATIONAL, INC. |
| Emberger, Luc | Member | AIRBUS |
| Graefe, Jonathan | Member | COLLINS AEROSPACE |

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| Grafu, Florin | Observer | ROMATSA |
| Haindl, Bernhard | Member | FREQUENTIS A.G. |
| Hawkins, Richard | Member | WIMAX FORUM |
| Kilbourne, Todd | Member | MOSAIC ATM, INC. |
| Lardon, Daniel | Member | THE BOEING COMPANY |
| Leonardon, Laurent | Guest | COLLINS AEROSPACE |
| Maiolla, Vaughn | Member | ICAO |
| Mirsayar, Ana | Member | INMARSAT |
| Morrison, Rebecca | Program Director | RTCA, INC. |
| Niraula, Madhu | Member | COLLINS AEROSPACE |
| Nisbet, David | Member | THALES GROUP |
| Nguyen, Lee | Member | FEDERAL AVIATION ADMINISTRATION (FAA) |
| Olive, Mike | Member | HONEYWELL |
| 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) |
| Skorepa, Michal | Guest | HONEYWELL |
| Soléry, Michel | Member | DSNA |
| Tamalet, Stephane | Member | AIRBUS |
| Vanguardia, Michael | Member | THE BOEING COMPANY |
| Van Wambeke, Nicolas | Member | THALES GROUP |
| Varkonyi, Bela | Member | FREQUENTIS A.G. |
| Von Groote, Anna | Technical Programme Manager | EUROCAE |
| Wams, Timo | Member | AIRBUS |
| Yonemoto, Naruto | Member | ELECTRONIC NAVIGATION RESEARCH INSTITUTE (ENRI) |
| Zeng, Dongsong | SC-223 Secretary | THE MITRE CORPORATION |

AGENDA

1. Welcome address. Meeting Organizational Issues
2. Approval of the Agenda
3. Administrative Remarks
4. Review and Approval of Previous Meeting Notes
5. Review and Approval of Changes to SC-223/WG-108 Terms of Reference
6. 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
7. Current State of Industry Activities
 - a. SESAR
 - b. ESA IRIS
 - c. Feedback on ICCAIA / Cyber-CAT Risk Assessment
 - d. Any Other Relevant Activities
 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

Due to the pandemic situation, the joint meeting was conducted through virtual telecons. Alope Roy, Chair of SC-223, and Stephane Pelleschi, Chair of WG-108, welcomed the participants.

Rebecca Morrison, Program Director, RTCA, and Anna von Groote, Technical Programme Manager, EUROCAE, presented the RTCA/EUROCAE antitrust, proprietary and membership policy statements. All participants agreed on the statements and no issue were raised.

Agenda Item 2. Approval of the Agenda

The group reviewed and approved the meeting agenda.

Agenda Item 3. Administrative Aspects

Each day the meeting has two sections, one is from 10:00AM to 12:00PM and the other is from 1:00PM to 3:00PM. Between the two sections, there is a one-hour break. The participants are asked to be considerate to all members, mute microphones when not speaking, and avoid talking over each other. If necessary, members should raise hand (i.e., click on the “hand” button in the WebEx application) to ask questions.

Agenda Item 4. Review and Approval of Previous Meeting Notes

The group reviewed and approved the previous meeting notes.

Agenda Item 5. Review and Approval of Changes to SC-223/WG-108 Terms of Reference

The workgroup reviewed the following tentative schedule changes in the draft SC-223 TOR version 6.

| Product | Description | Due Date | Change |
|--|---|-----------------|----------------|
| Minimum Aviation System Performance Standard (MASPS) for the Internet Protocol Suite used in Aviation A-G Communication System | MASPS for the Internet Protocol Suite for avionics certification. | December, 2022 | December, 2020 |
| Aviation Profiles for Internet Protocol Suite (DO-379 Rev A) | Certification profiles for TCP / UDP / IP / DHCP / Routing / Mobility / Multilink protocols based on IETF RFCs | December, 2022 | June, 2021 |
| DO-346A | AeroMACS MOPS update to address the required changes to ensure compatibility with other communication systems and standards | November 2022 | |

Decision 1. Draft TOR revision was jointly approved by SC-223 and WG-108.

Agenda Item 6. Current State of Standards

6a. ICAO WG-I (ICAO Annex 10, DOC 9896 ed 3, DOC 10090, DOC 10094, DOC 10095, DOC 10145)

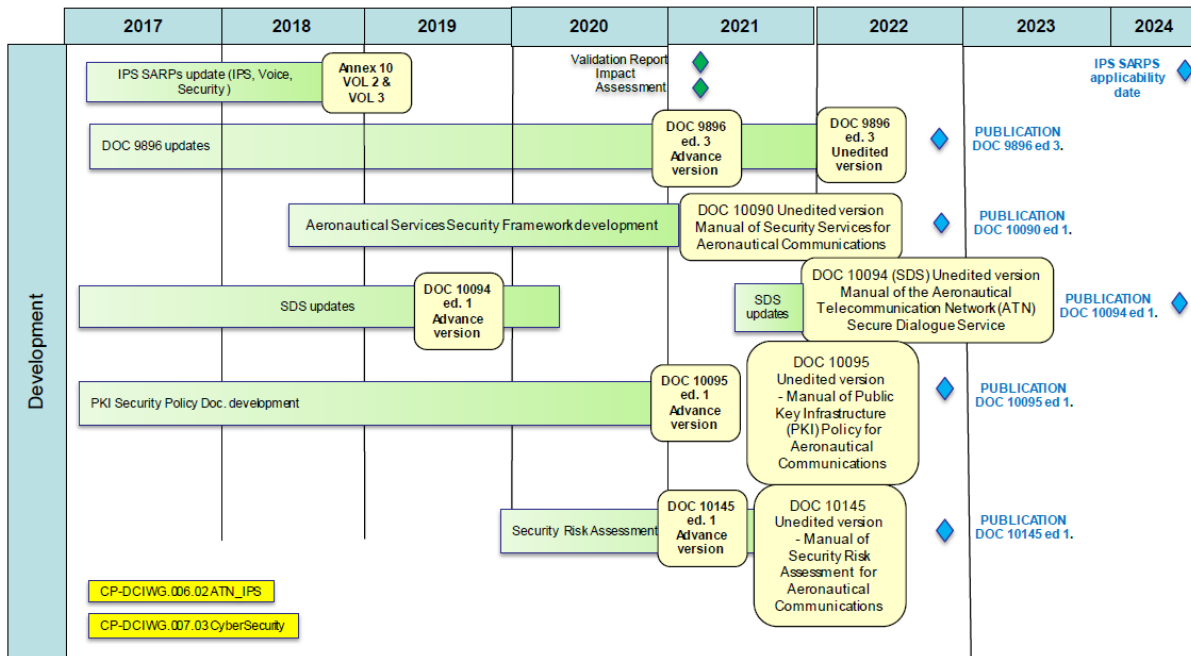
Liviu Popescu, EUROCONTROL, briefed the group on the schedule of ICAO IPS standards development, which is shown in Figure 1.

Action 2. Liviu Popescu and Alope Roy to write a standard flow-down chart for MASPS.



IPS SARPS and supporting DOCs development Timeline

All documents combined timeline



Note: Unedited version of a DOC - ICAO DOC publication supported by the Panels and approved, in principle, by the Secretary General, which is rendered available to the public for convenience. The final edited version may still undergo alterations in the process of editing.

Figure 1. ICAO IPS SARPs and Docs Timeline

6b. 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)

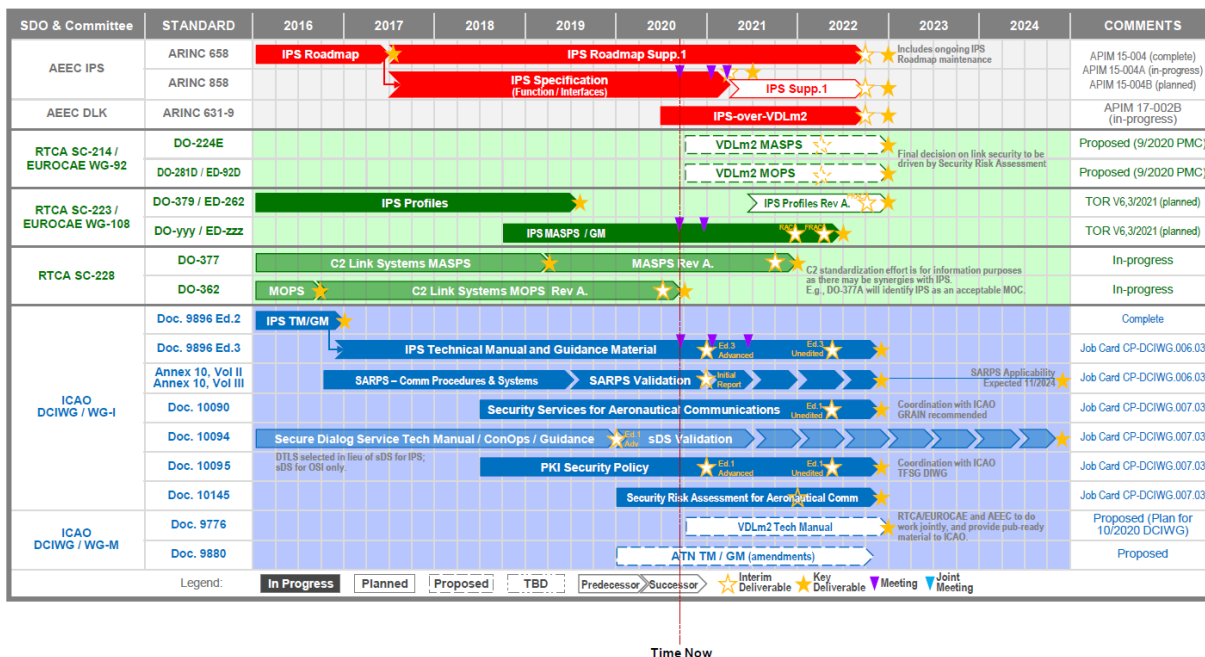


Figure 2. AEEC IPS A/G Standardization Roadmap

6c. ICAO TFSG

Jonathan Graefe, Collins Aerospace IMS, updated the group about ICAO TFSG status. ICAO TFSG is progressing as planned on governance policies, identity concepts and aviation IPv6 address preservation and management. TFSG is moving forward with IANA/RIR to reserve the /16 address block for ICAO. Currently, the address block request is going through ICAO internal and Legal approval process.

6d. Other Relevant Standards

No other standard activities were brought up during the meeting.

Agenda Item 7. Current State of Industry Activities

7a. SESAR

Francois d'Humieres, Frequentis, reported that SESAR2020 plans to finish the IPS CONOPS by the end of 2020. The final report is expected to be released by February 2021. This SESAR CONOPS can be leveraged for the IPS MASPS OSED.

7b. ESA IRIS

Bernhard Haindl, Frequentis, reported that IRIS is currently evaluating IPS multilink options and will provide inputs on IPS mobility to WG-I later.

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

Stephane Pelleschi, Collins Aerospace, led the group to go through the draft IPS MASPS section by section.

Timo Warns, Airbus, provided a presentation titled “MASPS Security Requirements – First Proposal” to the group.

Lee Nguyen, FAA, provided to the group a FAA policy paper “PS-AIR-21.16-02” on Establishment of Special Conditions for Cyber Security, a generic issue paper template (file name: Security ANM-111 Aircraft Electronic System Security Protection SPL version.doc), a copy of Notice of Proposed Amendment 2019-01, and the final Report from the Aviation Rulemaking Advisory Committee (ARAC) Aircraft System Information Security / Protection (ASISP).

The group discussed about the IPS security requirements and generated the following Action Items 1, 4, and 6, and Decision 3.

Action 1. Alope Roy to coordinate with Ravi Jain on Security Management and identity assurance.

Action 4. Madhu Niraula and Lee Nguyen to provide FAA generic papers related to aircraft level security assessment.

Action 6. Timo Warns to provide a draft outline of security section in MASPS.

Decision 3. MASPS will also provide guidance on the performance requirements for control plane in the IPS infrastructure (e.g., PKI, name resolutions, and mobility/routing)

Madhu Niraula, Collins Aerospace, presented slides titled “IPS MASPS Requirements in addition to SPR.”

Stephane Tamalet, Airbus, presented two white papers: one is on “IPS operational guidance” [file name: Third Airbus inputs for MAPS (December 2020 Meeting).docx], and the other is on IPS system performance requirements [file name: Another Airbus inputs for MAPS (December 2020 Meeting).docx].

The group discussed about the IPS performance requirements and generated the following action items and decisions.

Decision 2. ANSP is responsible for assuring performance from ANSP to the aircraft, therefore, suballocation of RCTP into CSP and ASCP components is not required. MASPS will identify measurement points within the IPS for consistency across implementations.

Action 3. Group to review Stephane Tamalet’s input papers on safety requirements and provide feedback on what should be covered in MASPS.

Action 5. Stephane Pelleschi and Madhu Niraula to provide draft latency allocations for RCTPcsp based on the discussion in the meeting.

Action 7. Brent Phillips to follow up with OPLINK people on PBCS status.

Action 8. Brent Phillips, Dongsong Zeng and Pete Muraca to make sure RCP requirements are adequate for existing/future data services and what RCTP and SLA requirements are used for CSPs

Action 9. Group to review ITU-T Y.1542 for performance allocation

Action 10. Alope Roy to update the CONOPS and bring in C2Link requirements for group consideration

Action 11. Stephane Pelleschi to identify MASPS topics for next telecon and remind action owners of their actions.

Agenda Item 9. Future Meetings

SC-223 P42 / WG-108, March 1 - 4, 2021, Virtual.

SC-223 P43 / WG-108, June 14 - 18, 2021, Location TBD.

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 3:00pm EST, December 10, 2020.

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 |

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| 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 |
| 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 |
| 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 |

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| | | | | 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 |
| 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 |
| 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 | 2/26/2020 – Closed. Action completed. |

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| 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 |
| P37-6 | Evaluate the impacts of splitting data flows among multiple links with performance-based multilink on ROHC performance | Collins Aerospace | Sept. 28, 2020 | 9/28/2020 – keep open 12/7/2020 – 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 | |
| P41-2 | Write a standard flow-down chart for MASPS. | Liviu Popescu and Alope Roy | Feb. 22, 2021 | |
| 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 | |
| P41-4 | Provide FAA generic papers related to aircraft level security assessment. | Madhu Niraula and Lee Nguyen | Feb. 22, 2021 | |
| P41-5 | Provide draft latency allocations for RCTPcsp based on the discussion in the meeting. | Stephane Pelleschi and Madhu Niraula | Feb. 22, 2021 | |
| P41-6 | Provide a draft outline of security section in MASPS. | Timo Warns | Feb. 22, 2021 | |
| P41-7 | Follow up with OPLINK people on PBCS status. | Brent Phillips | Feb. 22, 2021 | |

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| 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 and Pete Muraca | Feb. 22, 2021 | |
| P41-9 | Review ITU-T Y.1542 for performance allocation. | All members | Feb. 22, 2021 | |
| P41-10 | Update the CONOPS and bring in C2Link requirements for group consideration. | Aloke Roy | Feb. 22, 2021 | |
| P41-11 | Identify MASPS topics for next telecon and remind action owners of their actions. | Stephane Pelleschi | Feb. 22, 2021 | |

-S-
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